COAL AGE

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# Once Again We Greet You

By R. Dawson Hall.

COAL AGE appears today for the second time since the printing employees of New York City indulged in their unfortunate walkout. It was feared at first that the magazine would have to appear partly as regularly printed matter and partly written upon a typewriter and zincographed, but though much was prepared for printing in that piebald form, no need for such an ingenious expedient was found necessary. It appears, therefore, like an old familiar friend, with only a few unusual features, and in future issues a closer approach will be made to former standards.

The strike is not ended, but the delay in the production of Coal Age is. Slowly and surely your paper and our paper will pass from our hands to yours. The pleasure of editing and serving your interests will again be ours, and we trust it will be only in degree greater than the pleasure you will experience in receiving that weekly printed communication.

For there is no little pleasure in performing this, or indeed any service—a fact that too many of us often forget. As the years roll by, the work we have done for the world and for our neighbors is the principal benison conferred upon us. What we can do, not what we can seize, gives us the greater satisfaction.

The 153 magazines and 400 technical papers in New York City, and also the job printers, have alike been shut down by the remarkable tangle between the New York locals and the International organization. They are at length cutting themselves loose by printing or publishing away from New York City, where saner counsels prevail. Eventually some order in the publishing business will be reestablished, and Coal Age will be printed without a hitch in New York City or elsewhere.

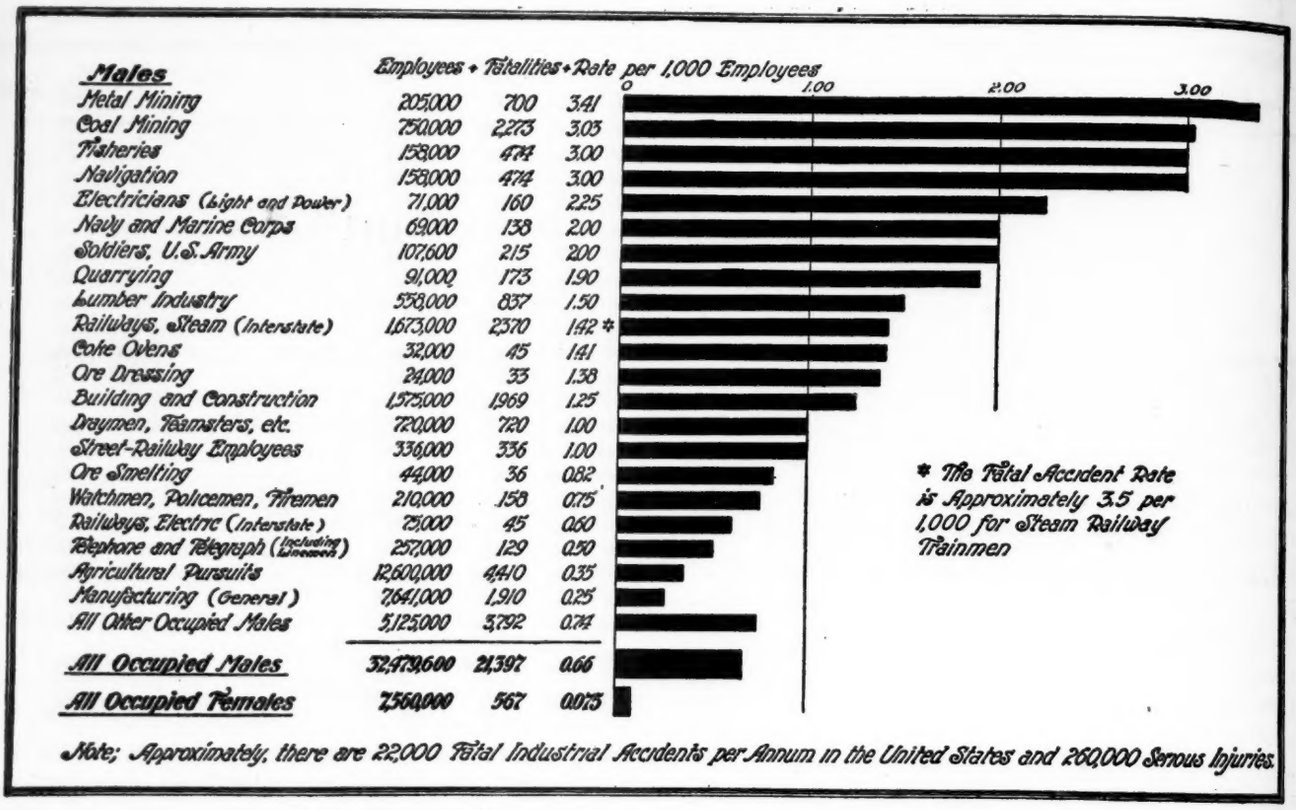
The laws of supply and demand have somewhat generally been ignored, and the law of organized grabbing has taken its place. The longshoreman is trying to get more money at the expense of the mine worker, who buys the food and other articles the longshoreman unloads. The mine worker is trying to make the longshoreman pay more for coal. The milkman is striking to make the barber exchange more money and services for milk, and the barber strikes to compel the milkman to pay more for a shave. The pressman is striking to make the farmer subscribe more liberally for his weekly farm journal, and the farmer is preparing to join up with the American Federation of Labor, so that he can demand with success that the pressman and his family pay more for bread.

So it goes in a world that we were told a little while ago would be organized for mutual service and brotherhood. What a travesty of the League of Nations is the plotting and scheming of one body of workmen to outvie another in the unreason and turbulence of its demands, and to pride itself, not on the large measure of its service or the faithfulness of its ideals, but on its ability to paralyze the public safety and destroy the public comfort.

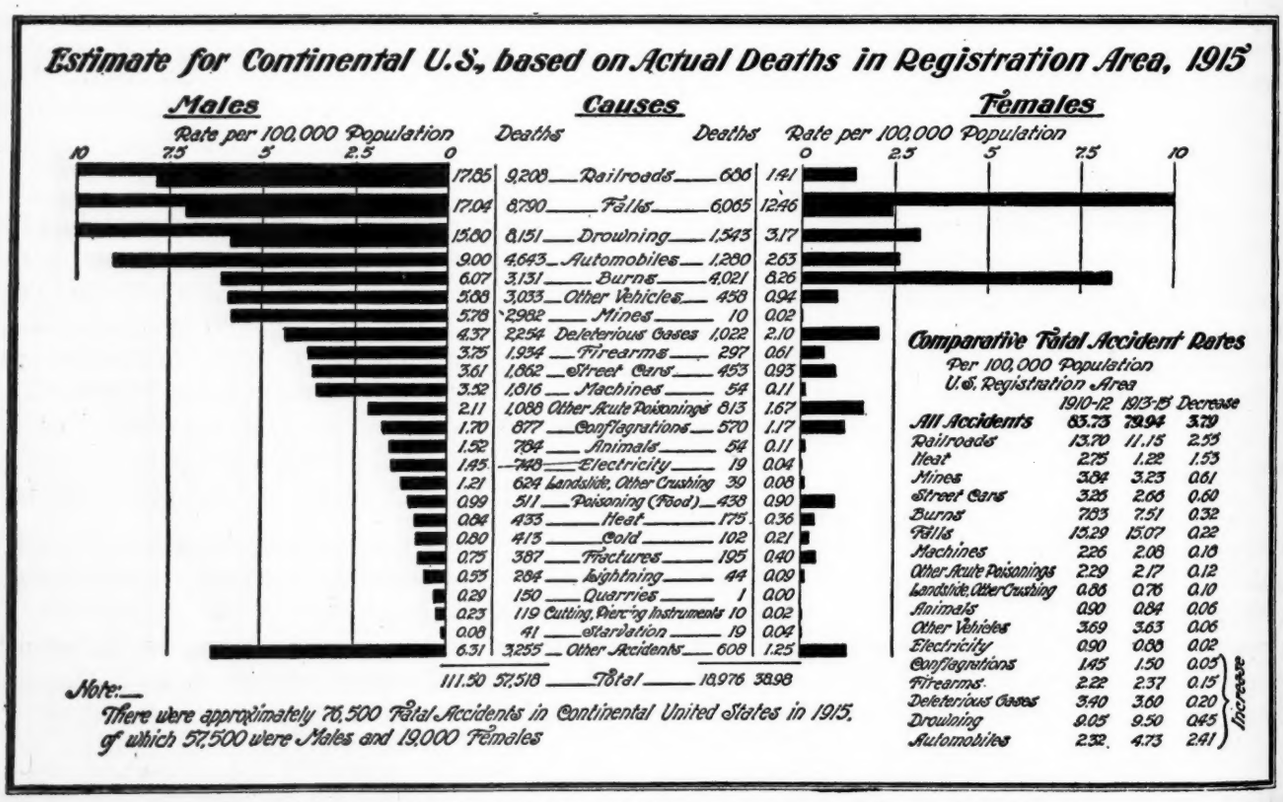
How can a large and irregularly civilized world be knit together when we cannot settle our own domestic problems in peace and amity? Can we believe in the good faith and justice of other nations till our own good faith and justice are proved beyond cavil?

# America Grows Less Careless

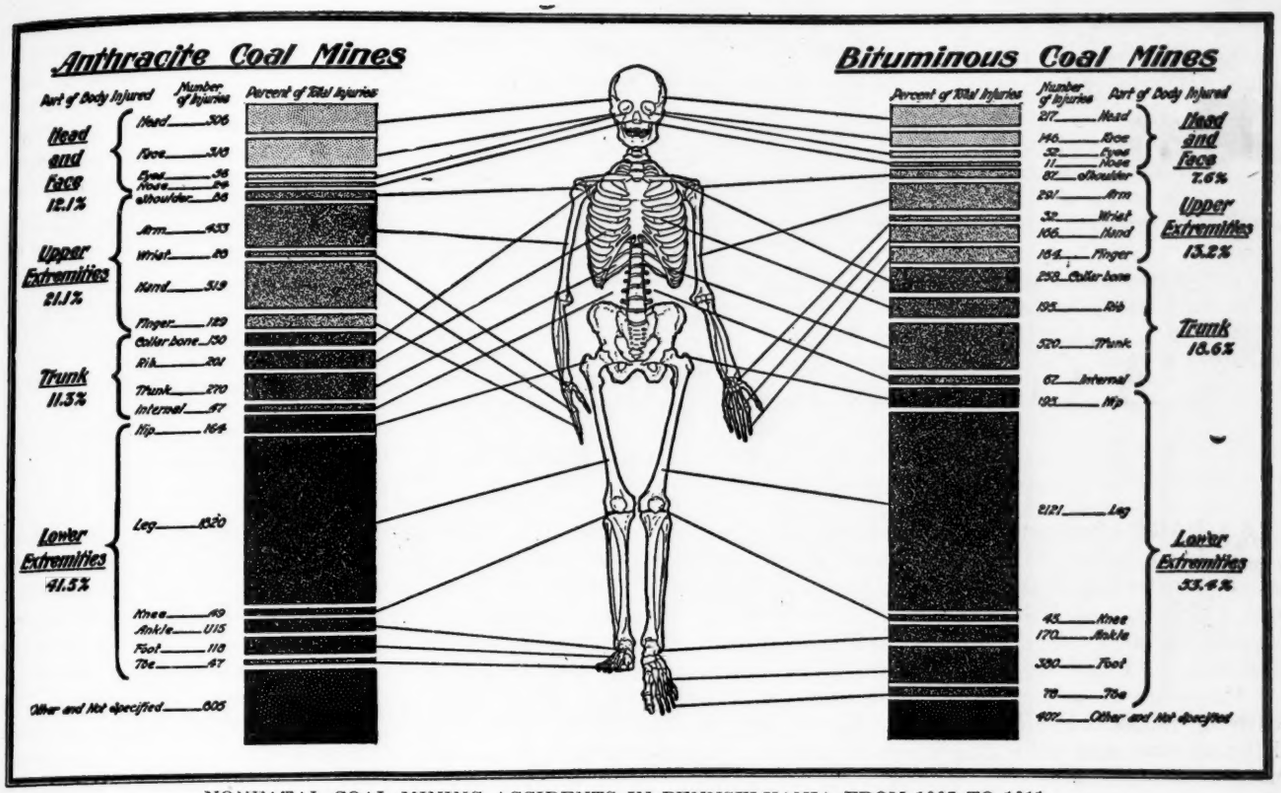
THE figures quoted below in this article are an advance summary of the mortality statistics for 1917 received by the National Safety Council from the Bureau of the Census of the United States Department of Commerce. The charts reproduced were prepared by the statistical department of the Prudential Insurance Company of America. As a result of the accident-prevention movement the total of acci-


Males
Employees • Fatalities • Rate per 1,000 Employees
0 1.00 2.00 3.00
Metal Mining 205,000 700 3.41
Coal Mining 750,000 2,273 3.03
Fisheries 158,000 474 3.00
Navigation 158,000 474 3.00
Electricians (Light and Power) 71,000 160 2.25
Navy and Marine Corps 69,000 138 2.00
Soldiers, U.S. Army 107,600 215 2.00
Quarrying 91,000 173 1.90
Lumber Industry 558,000 837 1.50
Railways, Steam (Interstate) 1,673,000 2370 1.42 *
Coke Ovens 32,000 45 1.41
Ore Dressing 24,000 33 1.38
Building and Construction 1,575,000 1,969 1.25
Draymen, Teamsters, etc. 720,000 720 1.00
Street-Railway Employees 336,000 336 1.00
Ore Smelting 44,000 36 0.82
Watchmen, Policemen, Firemen 210,000 158 0.75
Railways, Electric (Interstate) 75,000 45 0.60
Telephone and Telegraph (Including Linesmen) 257,000 129 0.50
Agricultural Pursuits 12,600,000 4,410 0.35
Manufacturing (General) 7,641,000 1,910 0.25
All Other Occupied Males 5,125,000 3,792 0.74
All Occupied Males 32,479,600 21,397 0.66
All Occupied Females 7,560,000 567 0.075
* The Fatal Accident Rate is Approximately 3.5 per 1,000 for Steam Railway Trainmen
Note; Approximately, there are 22,000 Fatal Industrial Accidents per Annum in the United States and 260,000 Serious Injuries.

MORTALITY FROM ACCIDENTS IN THE UNITED STATES IN 1915


Estimate for Continental U.S., based on Actual Deaths in Registration Area, 1915
Males
Rate per 100,000 Population
10 7.5 5 2.5 0
Causes
Deaths
Females
Deaths
Rate per 100,000 Population
0 2.5 5 7.5 10
17.85 9,208 Railroads 686 1.41
17.04 8,790 Falls 6,065 12.46
15.00 8,151 Drowning 1,543 3.17
9.00 4,643 Automobiles 1,280 2.63
6.07 3,131 Burns 4,021 8.26
5.88 3,033 Other Vehicles 458 0.94
5.78 2982 Mines 10 0.02
4.37 2254 Deleterious Gases 1,022 2.10
3.75 1,934 Firearms 297 0.61
3.61 1,862 Street Cars 453 0.93
3.52 1,816 Machines 54 0.11
2.11 1,088 Other Acute Poisonings 813 1.67
1.70 877 Conflagrations 570 1.17
1.52 784 Animals 54 0.11
1.45 748 Electricity 19 0.04
1.21 624 Landslide, Other Crushing 39 0.08
0.99 511 Poisoning (Food) 438 0.90
0.84 433 Heat 175 0.36
0.80 413 Cold 102 0.21
0.75 387 Fractures 195 0.40
0.55 284 Lightning 44 0.09
0.29 150 Quarries 1 0.00
0.23 119 Cutting, Piercing Instruments 10 0.02
0.08 41 Starvation 19 0.04
6.31 3255 Other Accidents 608 1.25
111.50 57,518 Total 18,976 38.98
Comparative Fatal Accident Rates
Per 100,000 Population
U.S. Registration Area
1910-12 1913-15 Decrease
All Accidents 83.73 79.94 3.79
Railroads 13.70 11.15 2.55
Heat 2.75 1.22 1.53
Mines 3.84 3.23 0.61
Street Cars 3.25 2.66 0.60
Burns 7.83 7.51 0.32
Falls 15.29 15.07 0.22
Machines 2.26 2.08 0.18
Other Acute Poisonings 2.29 2.17 0.12
Landslide, Other Crushing 0.86 0.76 0.10
Animals 0.90 0.84 0.06
Other Vehicles 3.69 3.63 0.06
Electricity 0.90 0.88 0.02
Conflagrations 1.45 1.50 0.05
Firearms 2.22 2.37 0.15
Deleterious Gases 3.40 3.60 0.20
Drowning 9.05 9.50 0.45
Automobiles 2.32 4.73 2.41
Increase
Note:
There were approximately 76,500 Fatal Accidents in Continental United States in 1915, of which 57,500 were Males and 19,000 Females

ESTIMATED FATAL INDUSTRIAL ACCIDENTS IN THE UNITED STATES IN 1916




NONFATAL COAL MINING ACCIDENTS IN PENNSYLVANIA FROM 1907 TO 1911

dental deaths in the death-registration area of continental United States during 1917 was reduced by approximately 6500 as compared to the previous year.

The total number of deaths caused by accidents during 1917 as reported in the summary was 53,544 as against 60,072 during the previous year. Inasmuch as the death-registration area of the country takes in only 70 per cent. of the population, it is apparent from the report of the Census Bureau that more than 76,000 persons were killed in accident throughout the United States in that year.

The greatest number of deaths charged to any one accidental cause—11,114, or 14.8 per 100,000—is shown for falls. The rate for this cause varies but slightly from year to year.

Next to falls, the greatest number of accidental deaths—8649, or 11.5 per 100,000—resulted from railroad accidents and injuries. This rate is greater than the corresponding rates for 1914, 1915 and 1916 (10.7, 9.9 and 11.3 respectively) but is lower than that for any year from 1906—the first year for which deaths from this cause were reported separately—to 1913, inclusive.

Burns—excluding those received in conflagrations and in railroad, street car and automobile accidents—were responsible for 6830 deaths, or 9.1 per 100,000. The death rate from burns was greater than that for the preceding year, 8 per 100,000, and was also greater than the rate for any earlier year covered by the bureau's records, with the exception of 1907.

Deaths from automobile accidents and injuries in 1917 totaled 6724, or 8.9 per 100,000 population. This rate has risen rapidly from year to year, but not so rapidly as the rate of increase in the number of automobiles in use.

Accidental drowning caused 5550 deaths, or 7.4 per 100,000. This rate is considerably less than that for any preceding year since 1910, and is also decidedly below the average for the decade 1901-1910.

Deaths due to accidental asphyxiation (except in conflagrations) numbered 3375, or 4.5 per 100,000. This rate is somewhat higher than that for any year during the preceding ten-year period.

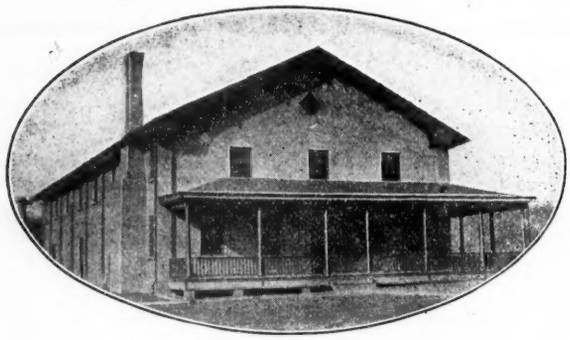
Mine accidents and injuries resulted in 2623 deaths, or 3.5 per 100,000. This rate is greater than the rates for the preceding three years and for 1912, but is lower than those for other recent years.

Deaths due to injuries by vehicles other than railroad cars, street cars and automobiles numbered 2326, or 3.1 per 100,000. The rate from this cause has declined somewhat during the past ten years, probably because of the decrease in the use of horse-drawn vehicles.

Deaths resulting from street-car accidents numbered 2277, corresponding to a rate of 3 per 100,000. This rate is greater than those for two years preceding and is the same as that for 1912, but is less than the rates for other recent years.

Machinery accidents caused 2112 deaths, or 2.8 per 100,000, a rate materially greater than that for any preceding year covered by the bureau's records.

The unhappy primacy of mining as a source of deaths from injury per thousand employees accentuates the need of further vigilance. For the whole nation's accident rate, mining is only seventh in importance; but as it affects a small number of people its incident on that population is quite severe. Railroads, falls, drowning, automobiles, burns and venicular accidents other than those from automobiles are liable to occur to both males and females, and to men of all occupations. Mining accidents happen to a restricted class of men. That the death rate from accident in this class rates seventh is a matter for continued careful consideration.



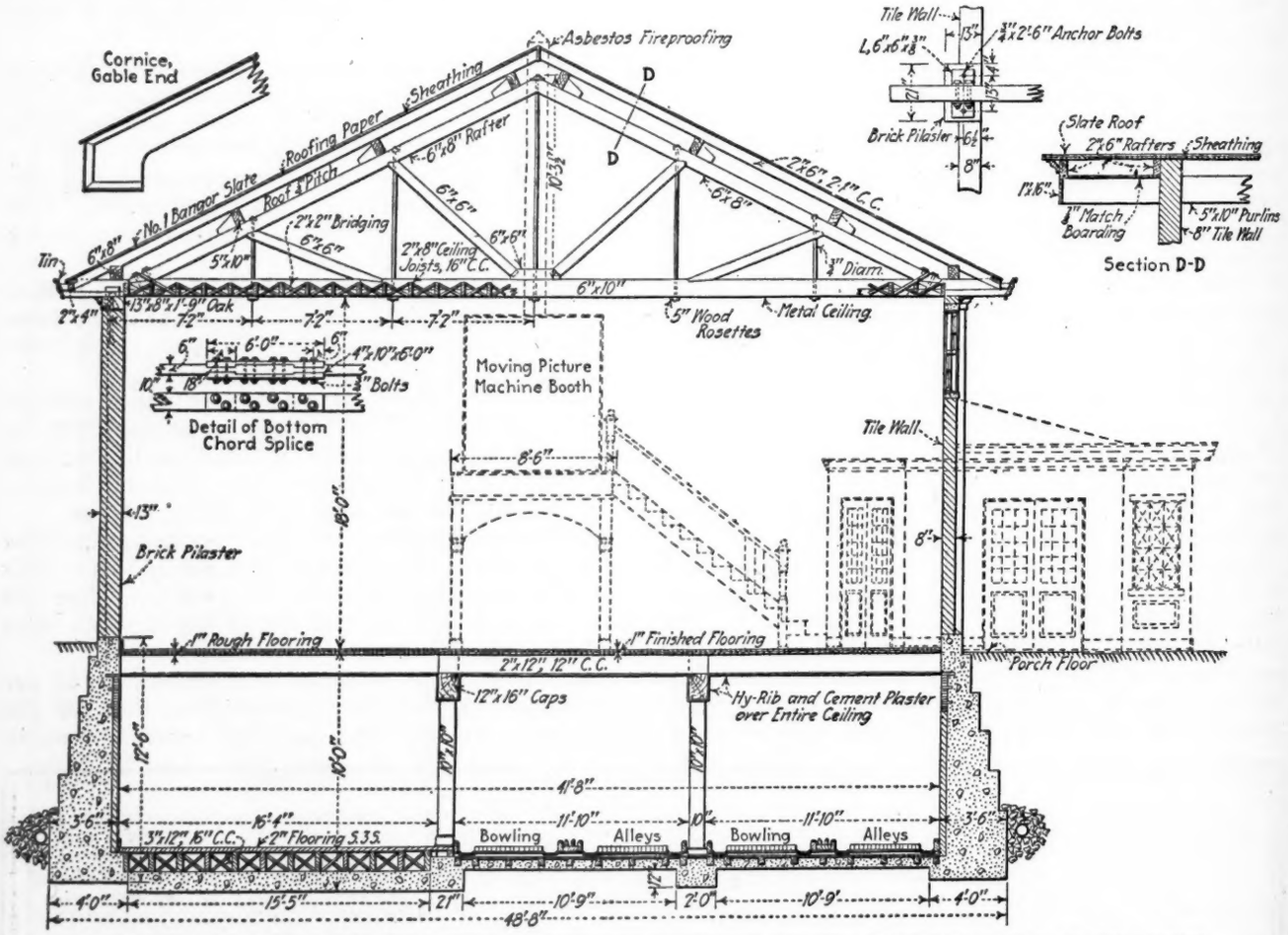
# A Community Amusement Building

BY DONALD J. BAKER
Pittsburgh, Penn.

AS PART of a general scheme to keep the men at home, a community amusement house has been constructed at the Isabella mine of the Hecla Coal and Coke Co., at Hillcoke, Penn. The building has been in operation since February, and from the start it justified the cause for which it was built. The idea of the value of a community amusement building at outlying mines originated with W. L. Affelder, of the Hillman Coal and Coke Co., of which the Hecla company is a subsidiary.

One of the biggest problems that the officials of any coal company have to face is to keep the men contented at mining operations that are situated some little distance from towns where amusements are available. In years past the general policy throughout western Pennsylvania has been for the operators to follow the lines of least resistance and not consider the all-important factor of the morale of the miner. But as labor was plentiful, no serious results followed and men were attracted to a coal plant by the wage and not by any variance of working conditions. The end of the war, however, has found the country menaced by a shortage of labor which, combined with the advent of prohibition, has awakened the coal miner to the sense of seeking out those places of employment that offered the greatest improved working conditions.

The old adage of "All work and no play makes Jack a dull boy" has come to the fore with startling



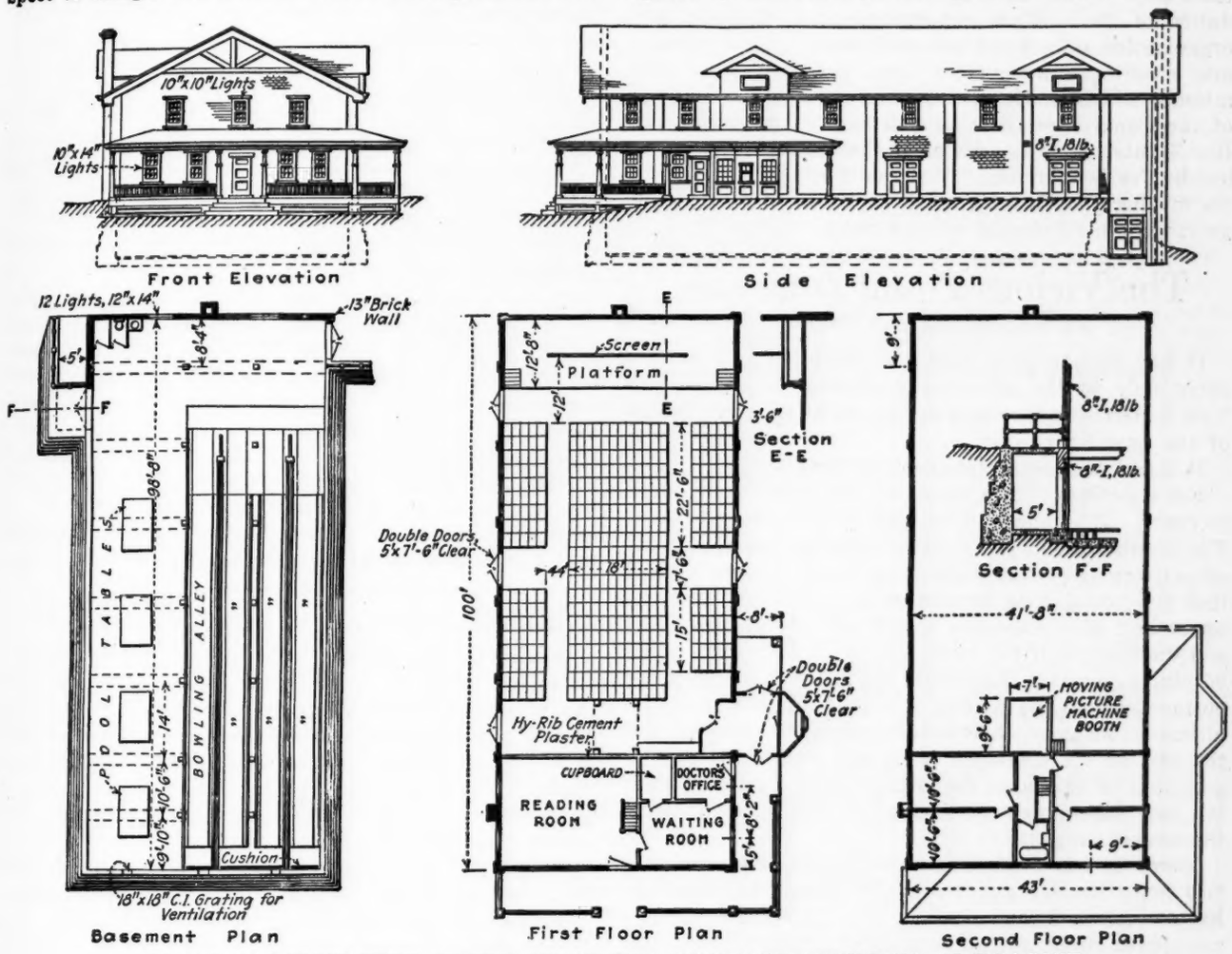

CONSTRUCTION DETAILS OF THE COMMUNITY BUILDING OF THE ISABELLA MINE AT HILLCOKE

significance. On the other hand, if the men are attracted by wages alone, one thing is certain: there will be a rush in the evening for those towns where recreation is possible. This is particularly true during the week ends. It has been proved that the men, especially the single ones, will often overstay their visit on Sunday and not be present when "Reveille" is sounded on Monday morning. As this type of employee is usually the one who is either motorman or spragger, a serious tie-up at the mine occurs with painful regularity. So the idea of bringing the amusements to the men was welcomed by them. The type of community amusement house was carefully thought out with respect to design and fixtures before the experiment was tried. The result has been so satisfactory that the building has been adopted as a model for all other operations of the Hillman Coal and Coke Company.

The building at Hillcoke is centrally located within the town, which has a population of 1200. It is of stucco-tile construction with fiber roofing. It is 100 ft. long by 43 ft. wide and is steam heated throughout. There is a basement and main floor, and a suite of rooms on a second floor for the use of a welfare director. D. G. Fitzgerald is in charge of the community and welfare work at the Isabella mine.

The basement of the building houses the bowling alleys, pool tables and a barber shop. Four Brunswick-Balke Collendar Co. bowling alleys are well lighted with 28 lights. There are four pool tables situated on the opposite side of the basement and running parallel with the bowling alleys. A two-chair barber shop is located in one corner of the room near the pool tables. The basement is extremely well lighted with 49 lights, many of which are of the chandelier type. This gives one light for approximately every 100 sq.ft. of floor space. A nominal fee is charged for the use of the alleys and tables, merely to discriminate between the prospective users. A portion of this money that accumulates is later returned to the men as prizes in tournaments that are frequently held.

The second floor of the building is used as a moving picture theater. A seating capacity of 310 furnishes ample space for all who care to attend. The interior is lighted by chandeliers, and a spacious stage is available




PLANS AND ELEVATIONS OF THE COMMUNITY AMUSEM ENT BUILDING AT HILLCOKE

for other forms of entertainment. An electrically operated piano is one of the features of the theater. Six- and eleven-cent charges are made for admission, which is for the purpose of discrimination and priority, as in the case of the bowling alleys and pool tables. Only the best of photoplays are shown, but in particular those that are rich in action. One night of each week is set aside as a "free" night, when "movies" from the Bureau of Mines, the Visual Bureau of the University of Pittsburgh, and other educational films are shown.

The theater serves as a church on Sunday, as well as for general public gatherings including school teachers' institutes, etc. This coming winter it is planned to vary the program with lectures, musicales and concerts, and vaudeville.

The fore part of the second floor is utilized as a

reading and rest room and is made doubly cheerful by reason of a large open fireplace. A state library is part of the equipment. This contains for the greater part books of fiction. All of the leading technical papers and periodicals are available for the grown-ups, while juvenile magazines are subscribed to for the children. A girl is placed in charge of the library whose duty it is to offer suggestions on the reading material available. Adjacent to the library is the doctor's office, containing several rooms.

Space for a playground is found in a vacant lot adjoining the building, the equipment for which has already been received and will be installed at an opportune time in the near future. Among the numerous duties of the welfare superintendent is included the organization of a band and orchestra. Peace gardens are encouraged among the boys and the town. An attempt will be made soon toward organizing a branch of the Camp Fire Girls as well as an organization of Boy Scouts. It is the desire of the officials to have the building self-sustaining. Any profits accumulating from the moving-picture returns will be used for the promulgation of other forms of welfare work.

## The Vicious Postal Zone Law

BY SENATOR ARTHUR CAPPER*

It has been argued that the postal zone increases apply only to the advertising sections of magazines. This is perfectly true as a statement of the mere words of the postal zone law.

It is not true as a statement of facts.

For a periodical or a newspaper is a unit from cover to cover. It is one unit of bulk that is never broken. The argument that the increased postage merely affects advertising is virtually the same as if it were argued that the postal zone legislation had provided that the upper half of a magazine should pay postal zone rates and the lower half flat rates. It would be a mere bookkeeping separation that would not in the least affect the postage cost to the reader, for the reader—who is the ultimate consumer—takes the magazine as it comes, and the cost of the magazine is its cost as a unit, and its postage cost to him is its entire cost as a unit, no matter how ingeniously or intricately one may subdivide the component parts.

There is one other important factor, also, which I feel many sincere and ordinarily keen-minded citizens have overlooked, and that is, that the magazine and newspaper differ from every other commodity—if you wish to consider newspapers and magazines as merely commodities—in the fact that it is the only "commodity" that is sold to the consumer at less than its actual cost of manufacture!

And a newspaper or magazine is the only "commodity" of which this is true.

Now as to the advertising and whether it should pay a higher rate than the body of the magazine. I think I have answered half of that question when I point out that the periodical and newspaper is the only product that is sold for less than its cost of manufacture, and that this fact is made possible by the advertising. Advertising is nothing but a bulletin board—the bulletin board of our economic, wealth-producing, business life.

Advertising is the one great factor in modern wealth production that enables wealth to be distributed almost instantaneously; a generation or so ago the same result could not have been accomplished without years of hand-to-hand selling and expensive, slow, personal salesmanship. You, as a thinking citizen, know what any restriction upon advertising would do to the wealth production of this nation. Congress itself saw this, and when means of war taxation were being carefully discussed and every channel was being developed, it was deliberately decided that the destructive economic effects that would follow the taxation of advertising would be too great and too dangerous to attempt.

Now then as to the allegations of the cost transmission of this second-class meter through the mails.

The figures upon which the absurd allegations of second-class deficits are made were compiled by the Post Office Department in 1908 and 1909—eleven years ago! So unreliable were they even then that when the U. S. Postal Commission, headed by the Hon. Charles E. Hughes, investigated them two years after their compilation, they were officially discredited as being no indication of what the costs were for the various divisions of second-class matter! Moreover, the Post Office Department since that date has taken pride in stating that it has in enormous and basic ways cheapened the postal cost of second-class matter.

The most unfortunate part of this postal zone legislation is that it is an insidious and dangerous attempt to set back postal history 70 years and reëstablish the universally condemned principle of postal cost determining the postal rates. It abolishes the sound postal principle of equal postage to all parts of our nation. The rural free delivery—one of the most vital and important postal functions—is conducted at almost a total loss, and if this vicious and unsound cost principle is once established the demoralization of our splendid postal principles is only a matter of logic and of time.

*Chairman of the Senate Commitee on Expenditures in the Department of Agriculture and Former Governor of Kansas

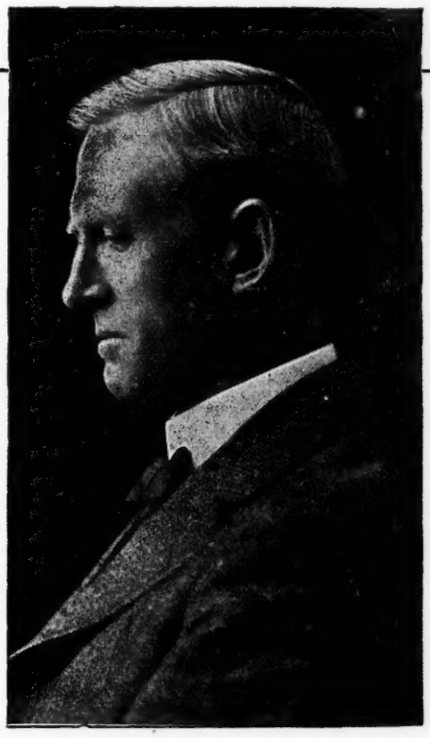
## Scientific Control of Boiler Equipment

It is often stated that boilers are uneconomical because too much air is admitted to the furnaces, and that all excess of air beyond what is necessary for the complete combustion of the fuel is a dead loss. This is not true. All combustion that must be carried out economically must have not less than 120 to 140 per cent. of theoretically necessary air. If maximum output is required, the amount of excess air necessary is 90 to 100 per cent. If it is attempted to use less than this quantity, it will be found the output becomesless.

There is a strange delusion, widely entertained, that forced draft enables a pound of coal to be burned in 18 lb. of air, while natural draft requires 24 lb. of air. If the same economy is to be realized, the same quantity of air must be used, quite independent of the means by which the draft is produced. Forced draft merely increases the output at the expense of the thermal efficiency.

The evaporation of a given quantity of water from a given boiler at a given rate of combustion requires the same quantity of air to be passed into the furnace, no matter what may be the calorific value of the fuel per pound. The time taken will also be in inverse proportion to the calorific value of the fuel. The rate of firing must, of course, be suited to the class of fuel. The rate of combustion mentioned above is the number of heat units developed per pound of air passed into the furnace. For maximum economy this is from 620 to 640. For maximum output, it is from 750 to 780.

# WHO'S WHO IN COAL MINING



C. W. PRICE

THE safety movement is so new, and we are so deeply immersed in it, that we hardly realize how immensely it is changing matters. When at length we look back at its beginning through the mists of history, we may view its leading men much as we are beginning to view the men and women of the early days of the Red Cross movement. They will no longer be regarded as innovators, mere stirrers-up of the industrial waters, whose activity tiresomely and often uselessly adds to the labors and decreases the spare moments of industrial managers. What the safety engineers have initiated will be looked upon as a permanent asset of the nation, a gift of the forefathers to those that come after, a kindly beneficence from a benign past.

It is hard just now to tell who will earn the plaudits of the future for yeoman service in the cause of safety, but C. W. Price, now general manager of the National Safety Council, and former assistant to the Industrial Commission of Wisconsin, which has, for many years, led in promoting human welfare and education, may well be among those thus celebrated in our industrial, and even in our national, annals. For the public will some day realize that even war is small and insignificant compared with its three less blustering brothers — accident, disease and the destruction wrought by mutual distrust—and is not by any means the biggest curse to which mankind is subject.

The "accident prevention career" of C. W. Price may be said to have begun 19 years ago when the International Harvester Co. placed him in charge of what was then known as "welfare work" in its Chicago plant. The harvester company is commonly recognized as one of the pioneers of safety work in America, because Mr. Price in his development of the welfare department of the company early sensed the need for a definite accident prevention movement within the plant and immediately set about creating it. That was about 12 years ago.

In 1912, when the Wisconsin Industrial Commission was organized, its members began to look around for a man with the experience and ability to carry on educational safety work, a man who could sell the safety idea to both employers and employees—truly a rarity in those days. The work done by Mr. Price at the International Harvester plant had come to the attention of the Wisconsin authorities, and so the position of "Assistant to the Wisconsin Industrial Commission" was offered to him. He accepted and found himself in a job that was brand new in the fullest sense of the word, for nowhere in America had anyone ever attempted to do what the Wisconsin commission proposed.

Mr. Price organized the educational work of the Wisconsin commission along lines that have since been followed in practically every other state where accident prevention work is being carried on as a state function. This work included the development of safe standards in the industries of Wisconsin to the advantage alike of employers and employees. In organizing the accident prevention machinery of the Wisconsin commission Mr. Price visited every large factory in that state and put into motion in every plant visited a safety organization that was thereafter to carry on the good work of its own motion. During this period Mr. Price also helped in the general organization of the inspection department of the commission on a basis that induced the close coöperation of employers with the state, something that was considered well nigh revolutionary in those days.

In the fall of 1912, incidental to the convention of the Association of Iron and Steel Electrical Engineers, there was held at Milwaukee, Wis., a meeting during which the idea of a National Safety Council was born. Of course, Mr. Price was one of the parents. A year later, at a meeting in New York, the National Safety Council was formally organized, and Mr. Price was elected a member of the Executive Committee. He served in this capacity for five years and in turn was vice president and director of exhibits of the council.

The work of the Wisconsin commission having become well established and the demand for the services of the National Safety Council increasing steadily, Mr. Price in the latter part of 1916 left the Wisconsin commission to become field secretary for the council. In this capacity Mr. Price took an active and important part in the development of local councils including that of the Western Pennsylvania Division at Pittsburgh and later the Central Mississippi Valley Division at St. Louis.

During the war the National Safety Council donated the services of Mr. Price to the War Department of the United States Government for four months, in which time he visited practically every navy yard and arsenal and with the coöperation of other talented safety organizers placed these branches of Uncle Sam's war machine on a safe basis.

In February of last year Mr. Price was withdrawn from the field by the Executive Committee of the Council and appointed general manager to succeed W. H. Cameron, who had resigned to become manager of industrial relations for the Eastman Kodak Company.

A genial man is C. W., as his photograph clearly shows. His personality grows on those with whom he is associated. The present is the first safety convention that has been under his direction. It sustained fully the reputation of those which were held in other years under the management of Mr. Cameron.

# Coal has Leading Place in Session of American Institute of Mining and Metallurgical Engineers

By R. Dawson Hall
Managing Editor, Coal Age

WHEN the American Institute of Mining and Metallurgical Engineers met on Monday, Sept. 22, at the Congress Hotel, Chicago, Ill., it soon developed that the coal sessions would overshadow all others in importance and that the coal problem would be the branch of mining that would be most assiduously studied. To coal had been devoted no less than three sessions; but that was not all. The question of mine taxation is as much a coal subject as it is one relating to any other mineral wealth, though it is true, the element of financial risk is greater in the opening and exploitation of other deposits, and the coal resources available are more readily computed than are those of most other minerals. As mine taxation was most capably discussed in coöperation with the Internal Revenue Department and in relation to a most excellent paper by L. C. Graton, of the National Resources Section of the Bureau of Internal Revenue, several coal men who were present at the meeting deprived themselves of the pleasure of attending one of the coal sessions in order to listen to the discussion on Mine Taxation. Notable among these was R. V. Norris, who talked most interestingly on the taxation problem.

As for trips, it was early learned that the Gary steel works excursion would have to be abandoned. The important visits therefore were to the La Salle district, with its coal operations, and to the Franklin County coal mines. An impromtu trip to the works of the Sullivan Machinery Co., for at least many of the coal men, took the place of the abandoned steel-works excursion, the visit being made in the morning of Tuesday, Sept. 23.

## COAL SESSIONS BEGAN EARLY

The coal sessions opened on Monday morning in the Elizabethan Room of the hotel by the presentation of E. A. Holbrook's paper on "Research in the Coal-Mining Industry," Carl Scholz presiding. Mr. Holbrook was, unfortunately, not present to do his paper justice. The article that followed—"Some Factors That Affect the Washability of Coal," by Thomas Fraser and H. F. Yancey—presented by the former and discussed by both authors, showed that in Franklin County, Illinois, where the percentage of sulphur at one mine rose to 3.51 per cent., the "organic" sulphur content was 1.67 per cent. Thus 48 per cent. of the sulphur was organic and not pyritic or sulphatic and therefore could not be reached by washing. Adding to that the infinitesimal pyrite particles which cannot be washed out and the pyritic which can only be separated by tabling or flotation, it is easy to see that jig washing will do little to remove the ultimate sulphur where the most unfavorable conditions exist.

In Pike County, Kentucky, is a bed which fortunately needs little, if any, sulphur reduction. The sulphur content is only 0.46 per cent., of this only 0.13 per cent., or 28 per cent. of the whole sulphur content, is pyritic. The organic sulphur, which runs 0.33 per cent., supplies the rest of the sulphur content, which is of course as much as 72 per cent. of the whole quantity. This figure is well worth holding in mind: practically one-fourth pyritic sulphur and three-fourths organic sulphur.

No wonder with facts like these C. A. Meissner, well known as a coke expert, later declared that we shall have to modify our ideas as to the manner in which sulphur shall be removed and yet more as to the degree to which this can be done. Guy H. Elmore well said at a subsequent session that no longer can we confidently state, as we did in years past, that careful washing would always remove half the sulphur and that the bulk of that half was to be found in the ash and was removable with it.

The next two papers "A Use Classification of Coal," by George H. Ashley, and "Distribution of Anthracite," by A. S. Learoyd were presented, but not adequately discussed, the authors not being able to attend. It is unfortunate that Mr. Ashley's splendid paper has been so passed over by the institute, but there is no reason why it should not be submitted for the attention of the members at some time when the author is present and able to give the members the full benefit of his discussion, accompanying this by charts showing the geographic distribution of coal by classes.

## FREE SULPHUR AND FREE IRON MUST BE RECKONED WITH

R. Dawson Hall, at the close of the session, pointed out the ability of free sulphur and free iron in the presence of water to combine and form bisulphide of iron, thus creating much heat. The question arises, of course, whether any of the organic sulphur will act in any way as if free. When coal is coked half the organic sulphur appears to carry over into the coke just as does the pyritic sulphur. That, however, does not show that there is not in a degree some sulphur that is held in loose combination.

The smell of the smoke from a half-ignited coke oven would seem to suggest the presence of such a sulphur. Nor does the ultimate reduction in organic sulphur of 50 per cent. in the coking process show that in the lignites and peats there is only 50 per cent. of such less-stable sulphur. Now that the presence of organic sulphur seems to be satisfactorily proved, it would be well worth while to try to find out just how stable it is in the presence of heat in the various forms in which it exists.

In most coal piles there is some form of free iron—a driftbolt in a trestle, a coupling pin, a nail or some like form of the element. Could not the combination of the iron and sulphur be a possible source of heat? It seems that the action of combination between these two elements would be more potent to form heat than the oxidation of pyrite or the oxidation or hydration of coal. It is only a suggestion, valueless perhaps, but not wholly improbable.

At the afternoon session Carl Scholz also presided. This sitting opened with the presentation by C. M. Young of an article on the "Height of the Gas Cap in the Safety Lamp." Unfortunately the experiments were made with city gas and not with the methanized mine atmosphere, in which the safety lamp is normally required to give its indications.

There followed the most interestingly discussed paper, but one, of those presented—"Engineering Features of Large Modern Coal Mines," by C. A. Herbert, (who was absent) and C. M. Young. Mr. Young, being present, gave a brief account of the contents of the paper. Carl Scholz pronounced the opinion that alternating current would supersede direct current. He was not afraid, with steel-jacketed conductors, to put high-voltage cables into the mines, knowing that not even a pick could make a hole in them. A derailment might, however, cut a cable with bad

results; consequently Mr. Scholz puts the cables on traveling ways where this contingency is eliminated. However, it is not well to run any unnecessary risk so the line is laid in a ditch and covered with a plank. Should any one be digging around the cable the presence of the plank would warn him that he was approaching the high-tension conductors.

The secondary lines are hung to the roof. They have merely protection against the moisture of the mine and are not steel-jacketed like the primary lines. Mr. Scholz said that with alternating current it was impossible to burn the motors, because the alternating-current motor would refuse to function entirely if the voltage dropped, whereas the direct-current motor would go on working, taking a greater amperage and so heating up its coils faster than the heat could be dissipated, thus burning out the machine.

In discussing the use of the skip, George S. Rice declared that, in his belief, the breakage of coal accompanying its use would not be excessive, for the large quantity of coal would cause a self-choking which would make the material pour out instead of being thrown out, as it is where the car is hoisted and discharged from a self-dumping cage.

Mr. Rice stated that he designed the third steel tipple to be erected in Illinois, and that about 1892 he installed a skip hoist in Spring Valley. Carl Scholz declared that it was his expectation that owing to the pouring quality of the coal discharge there would not be any abnormal degradation. The use of a revolving, instead of an end-gate, dump in the mine is also likely to reduce breakage, though he did not so state.

E. N. Zern criticized the few headings being driven in the Valier and other Illinois mines. He thought that the eight-entry system was needed in large operations where considerable volumes of air had to be delivered. The Valier mine has in its main entries only four airways.

Mr. Scholz said that he expected to deliver 300,000 cu. ft. of air per minute with only a 3 in. water gage when the mine reached its most remote development. With headings costing $1 per running foot it was not permissible to drive as many of them as was customary where the miners were willing to drive them without additional charge.

## BLASTING IS AVOIDED

As for the Jeffrey heading machines, they were installed as much to save blasting as for any other reason. Mr. Scholz declared he had carefully considered the large charge for timbering and immense cost of its replacement, and it was mainly to avoid that charge that he introduced machines that eliminated blasting and so left the coal, roof and ribs unshattered and equal to the task of staying in place under the pressure from 605 ft. of overburden, which is the cover at the Valier mine.

James W. Paul said that the rock-dust provisions at the mines of the Old Ben Corporation were credited by the company with having saved the workings from two explosions. He thought that if the vanes by which the rock dust was upheld were placed a little further apart, all the dust would not be deposited as a result of the violence of the pioneering wave. There would then be enough dust remaining to enable the barriers to cope with the explosion wave proper that was likely to follow and might pass through the headings if all the dust that had been prepared for the purpose of extinguishing it was already deposited on the floor of the mine.

Graham Bright, in discussing the rope speed in skip hoists, declared that this speed was not merely halved by the greater load which the skip carried, making fewer hoists necessary, but was actually divided by three by reason of the fact that time was saved in both loading and unloading.

Two papers followed, one entitled "Gas-Producer Practice," by G. S. Brooks and C. C. Nitchie, both authors being present and the latter reading the paper. The other paper was entitled "Testing of Coals for Byproduct Coking and Gas Manufacture," by Horace C. Porter. Mr. Porter's paper was on the possibility of forecasting by experiments in miniature the probable outcome of the coking of coals in different types of coke ovens.

Wilbur Stout's paper on "Coals of Ohio and Their Limitations for Byproduct Coke" was not presented, the printed paper not being available and the author being absent. H. W. Young briefed his interesting article on "Outdoor Substations in Connection with Coal-Mining Installations." In discussing it Mr. Bright said that it was dangerous to meter on the high-pressure side of the transformers where the high-tension current was at 66,000 volts. The best plan was to meter on the lower-tension side, but as this would be too favorable to the consumer as against the public-service corporation it was customary to make the proper allowance for transformer losses.

The author of the paper, H. W. Young, agreed with Mr. Bright, saying that it was the practice with his associates to meter on the high-pressure side of the transformer station, only when the high-tension was 33,000 volts or lower.

The many discussions on Mine Taxation, on Non-ferrous Metallurgy and Metallography, on Geology and on Milling and Industrial Organization, interesting as they were, especially that on taxation, are here passed over in favor of the more important coal sessions.

The session on Mine Taxation was resumed on Tuesday morning and was rather dull for those who attended it. The speakers were excessively lengthy and deliberate, and everything was pitched in such a low tone that little could be heard. In the afternoon the session on Iron and Steel was held with a big attendance, and in the evening a number of members participated in the Oil session.

## THE SMOKER WAS A SUCCESS

Something should be said here, however, about the smoker held in the Gold Room on Monday evening, in which the ladies participated—but did not smoke. The ladies were in the balcony and the members of the institute in the hall below. A comic skit regarding the flotation of the Jno. D. Oil Co. was the principal entertainment. Most of the leading members of the American Institute of Mining and Metallurgical Engineers were subjected to a clever discharge of wit which amused every one and troubled no one.

There was the usual glee club, the efforts of which were aided by the singing talent of both the ladies and gentlemen present. A cartoonist made comic portraitures of some of the notables at the banquet and contributed other clever sketches.

Wednesday's "Symposium on Sulphur in Coal" was one of the most interesting sessions the institute has ever held, even though no lantern could be obtained to show Rheinhardt Thiessen's slides, which were to accompany his address on "Occurrence and Origin of Finely Disseminated Sulphur Compounds in Coal."

The first paper was one by I. C. White, who was unable to be present, on "Geographic Distribution of Sulphur in the West Virginia Coal Beds." In this it was pointed out that the older coal beds geologically have the greater amount of sulphur in them. A. C. Fieldner, of the Bureau of Mines, added that the percentage of sulphur is somewhat generally high where the ash is fusible at low temperature.

R. D. Hall added that, speaking of West Virginia, the percentage of sulphur was usually high where the percentage of volatile matter in the coal was high, and thought

perhaps this was more than a coincidence, that possibly heat had removed the sulphur as well as other volatile matter before the sulphur had combined with the iron. Then it was that a discussion arose as to the stability of organic sulphur under heat and the statement that it was unsafe at the present stage of our knowledge to assume that organic sulphur, especially as it now exists in our coals, is nonstable.

Professor H. H. Stoek, who presided, pointed to the statements in Gilbert H. Cady's paper, not then presented, in regard to the low-sulphur coal in the Franklin County field, which does not appear to be an area of any great disturbance and heat.

Dr. Thiessen's paper was unusually good, perhaps the best of those presented. In the comment on it Mr. Hall called attention to the fact that sulphur did not exceed 0.1 per cent. in the whole lithosphere, but composed as much as 1.1 per cent. of the volcanic rocks according to Frank Wrigglesworth Clark. Clearly the organic bodies that contain so much sulphur must have segregated this element, for it is found in larger quantities in coal, asphalt and some petroleums than in volcanic rocks. It is found also in lesser quantities in natural gas. He pointed out how small in percentage is the sulphur found in the sedimentaries above and below the coal where pyrite might be expected to form but did not.

## SULPHUR APPARENTLY HAS TWO ORIGINS

However, there were those who declared that while the finely comminuted pyrite might be organic in origin, the larger lenses and nodules of pyrite probably had another source. Seeing, however, that they can be found nowhere in the measures above and below the coal, the proposition does not seem quite tenable and the question of the source seems likely to stand or fall with the solution ultimately found for the general problem as to the organic origin of coal sulphur. It may be said that a discussion of the nature of the sulphur in coal occurred in **Coal Age**, Vol. 4, pages 273 and 274, and in the same volume, page 586. Both articles appeared in 1913, when pyritic sulphur was universally held to be extraneous and not organic in origin.

A. C. Fieldner declared that he had found the organic sulphur in coal more stable than the pyritic. At the Bruceton mine the crop coal and coal under deeper cover was analyzed for sulphur and the percentage was notably greater in the coal further in the mine than in that near the surface. In both cases the coal was ground and subjected to a float-and-sink test, the liquid being of a specific gravity of 1.35.

Taking off the float and analyzing it, it was shown to have only 1 per cent. ash. It was noticeable that this relatively ash-free coal had in both samples, the near-surface and the interior samples, the same percentage of sulphur, namely 0.6 per cent. This fact led Mr. Fieldner to regard the pyritic sulphur as less stable than the non-pyritic, which is undoubtedly true as far as the weathering that is, the oxidizing process is concerned. It may or may not hold, however, as to heating.

As far as coking is concerned, the instability of some organic sulphurs in the presence of heat is of little importance provided the unstable organic sulphur will be given off before the coking temperature is attained. It is almost certain that some organic sulphurs are given off in the coke oven, but the temperature at which this occurs is not of primary importance so long as we are sure that the necessary temperature is reached. The stability, at low temperature, of the organic sulphur may be important as regards spontaneous combustion and might have relevancy in the making of gas. As far as coking is concerned, we are apparently in more of a quandary than ever, now that we find that organic sulphur still exists in the coal.

Pyritic sulphur may surrender to washing or oxidation or even flotation, but organic sulphur which is of the very essence of coal must be subjected to a process which chemistry has up to the present not even conjectured, much less outlined.

The whole subject of the reason for the prevalence or non-prevalence of pyritic sulphur C. A. Meissner showed was not readily explained because beds vary much in their sulphur content. The middle of the seam will occasionally have less than the top or the bottom. Evidently heat has nothing to do with that variation. S. A. Taylor pointed out that seams had a varying sulphur content with location, the variation occurring markedly, not merely in a single field, but in the area subject to operation from a single mine or even in that served by a single entry. It was also shown that sulphur was found mostly in swags or small basins. There are three ways in which the dip of the measures might help to preserve the sulphur. They might localize the iron solutions and the iron acting as the jailor of the sulphur might preserve it in the swags to a greater degree than it is preserved elsewhere; or again, the presence of the water in the swags might accentuate those bacterial processes by which the sulphur is retained; or third, the presence of the water might assist in the combination of iron and sulphur.

## UNSOLVED PROBLEMS

All these are difficult questions and they still await thought and elucidation. There were not a few present to argue for "secondary enrichment" (the words sound like a none too merry jest with regard to iron pyrite in coal). Even if they are constrained to admit that the pigmy dots of pyrite crystal found by Mr. Thiessen are indigenous, they argue that the lenses and nodules must have another origin.

J. R. Campbell was not present to brief his article on "Mechanical Separation of Sulphur Materials in Coal." George H. Ashley also was absent, and his "Sulphur in Coal—Geological Aspects," received little discussion. A. R. Powell briefed most admirably his article "Forms in Which Sulphur Occurs in Coal," while C. W. Parmelee's paper, "Effect of Sulphur in Coal Used in Ceramic Industries," closed the session.

In the afternoon, seven papers of the "Symposium on Sulphur in Coal" were presented, the first, "Removal of Sulphur from Illuminating Gas," by W. W. Odell and W. A. Dunkley, being discussed at length. Dr. Darlington mentioned that Ferrox, a new mixture of ferric hydrate and some binding material such as cement, was giving excellent results. It has a capacity about 50 times as large as other materials used for the desulphurizing of gas. He added that the material as prepared was mechanically strong enough to bear the weight of a man.

It was said that letting air into the gas served to an extent to revivify the purifier, as the authors of the paper said, and this could be done without bringing the gas below standard, providing the gas was enriched, but that it must not be thought that the presence of a small amount of air will prevent ultimate fouling.

The paper on "Low Sulphur in Coal," by H. M. and T. M. Chance, though printed, was not available at the meeting and neither author being present it received scant attention. It was suggested, however, that the probabilities were that the sulphur in the Greene County coals of Pennsylvania would run higher than the authors thought, as the showing in West Virginia adjacent to Greene County is not by any means favorable, whatever it may be on the Monongahela front.

Williard R. Jillson's paper, being mostly geographical in its discussion of the low sulphur coals of Kentucky, its content was not discussed. Following these came "Low Sulphur Coal in Illinois," by Gilbert H. Cady, presented by State Geologist Frank W. De Wolfe.

He stated that while the coals in the Franklin County low-sulphur area were low in moisture content, as compared with Illinois coals as a whole, they were not as low in moisture as some other coals in Illinois. He more or less punctured the notion that the low-sulphur coals of Franklin County owe that quality to early heat action. Had they been subjeced to early heating they would probably have advanced further in their mineralization.

"Sulphur in the Coking Process," by S. W. Parr; "Commercial Recovery of Pyrite from Coal," by S. H. Davis, and "Sulphur in Producer Gas," by F. Crabtree and A. R. Powell, then followed. In regard to the second paper it was pointed out that the objection to coal in pyrite was that it increased the heat too much when roasting the pyrite, involved the use of too much nitric acid in purification and generated quantities of $CO_2$ which delayed the formation of sulphuric acid. To keep down the heat the quantity charged had to be reduced.

On the same day, Wednesday, sessions were held on Iron and Steel, on Mining and Local Resources, Pyrometry with special reference to Iron and Steel Metallurgy, and on Nonferrous Metallurgy. In the evening President Horace V. Winchell held a reception in the Elizabethan Room, and this was followed by a banquet in the Gold Room at which Robert W. Hunt was toastmaster and Horace V. Winchell, Francis S. Peabody, Theodore W. Robinson, Bradley Stoughton and Charles M. Schwab were the speakers.

Mr. Peabody spoke on his hobby, "Coal Conservation," Mr. Robinson extolled Chicago in an extremely happy vein, ending with a few words on the steel strike, and Mr. Schwab told again some old stories in a way that never tires and praised "human engineering as the greatest of all kinds of technical skill and as the art in which every engineer should excel." Schwab's stories, unlike steel, never seem to suffer from what is known as "fatigue."

On Thursday, Sept. 25, the visitors, except those pyrometrically inclined, left for La Salle, a city 99 miles from Chicago. (The "Symposium on Pyrometry" at 10 a.m. was the only technical session of that day and was the last of the series. It was held in Chicago.)

On the arrival of the train at La Salle the 200 guests were entertained at the Hotel Kaskaskia, after which they were divided into four groups—mining, scenic, geology and industrial and went in automobiles their separate ways to points of interest.

The mining group for the most part went to the Union mine, of the La Salle County Carbon Coal Co., just outside La Salle. This mine is approched by a shaft 400 ft. deep and operates in the "Third Vein," according to Illinois parlance, or in the No. 2 bed, according to the nomenclature of the U. S. Geological Survey. The coal is transported in small vertical-sided cars of 3 ft. 5½ in. gage. The capacity per car is about 2499 lbs. net. The current used in the mine for haulage and coal cutting is carried to the transformer station at a tension of 2200 volts. It is distributed for the locomotives and the five Sullivan longwall coal-cutting machines at 240 volts, direct current. The coal is hoisted by an Ottumwa electric hoist, driven by a General Electric 225 h. p. induction motor with automatic control and air-brake connection.

Much of the mine is heavily timbered, as the roof has broken up quite high. As the mine is operated by longwall no signs of coal are to be noted in the long journey from the shaft pillar to the longwall face. The mine is perfectly dry and yet quite safe from dust explosions, for the cars are not so heavily topped as to distribute coal along the roadways while the roof and sides are continually providing a finely ground shale, dust which is the most perfect defense against a mine explosion.

As the locomotive and cars ran along the rails with their freight of visitors a continuous sand storm (or rather shale storm) beat against their faces, convincing proof of what a coal-dust cloud would meet should it try to cause trouble in this mine.

The packwalling is carried close up to the face, so that there is just enough room when cutting to pass the machine between the packwall and the face. The gathering is done by mules. All the mines in this field are operated by the longwall system, except the Matthiessen and the Hegeler mine, where room-and-pillar methods are employed. Most of the mines are comparatively level, though at the Illinois Zinc Co. No. 1 mine the coal pitches decidedly.

Some of the mining party then went to the Cedar Point plant of the La Salle County Carbon Coal Co., and others to the mills of the Mineral Point Zinc Co., where they inspected the pouring out of zinc into molds, its annealing and rolling, and also visited the roasting furnaces. The party arrived in Chicago early in the evening, and the 26 who decided to visit the Franklin County field had barely time to wash and dine before starting on the second trip.

Franklin County has some of the largest mines in the United States and some of the most up to date. It is a field having no small operations for, since the cost of shaft sinking is considerable, it does not pay to put in a plant of small dimensions.

The best of the coal land is now selling at around $250 an acre, but twenty years ago it could have been purchased for less than $25. Fortunately the surface is of little value and is not farmed extensively, and with a little care in makin the deeds it should be easy to secure the right to mine without providing surface support to the wild land that surmounts the coal.

When the party arrived at Benton and had been well fed at Jedd's Cafe, it was piloted back to a special train by Carl Scholz, who personally conducted the trip. This special train took the party to mine after mine in the Franklin County field. The first two mines visited were Nos. 9 and 8, of the Old Ben Corporation, located at West Frankfort. At No. 9 the first unit of the plant visited was the rock crusher, where rock is crushed for the rock-dust barriers that are in use at all the mines of the company. A Raymond rock crusher reduces the shale to dust, so that 92 per cent. goes through a 250-mesh screen. About 30 tons are produced per shift.

Another interesting feature at this plant was the storage of the smaller sizes of coal. The coal is conveyed from the tipple and dumped on a small pile. There a Link-Belt storage shovel with a clam-shell bucket and a 90-ft. boom lifts the coal and carries it to the storage ground where it is piled to a depth of about 49 ft. When it is desired to reload the coal the same shovel picks it up and moves it back to the original dumping place, where it falls into an elevator boot and is carried back to the tipple.

The coal is not allowed to remain in storage for any length of time. The storage yard is merely an equalizer of car supply, a flywheel that has had to be provided because of the scandalous irregularity and inefficiency with which the Government railroads are being run.

At these mines 45-lb. rail is used on the main haulage and 20-lb. in the rooms, steel ties being used everywhere. Sanford-Day cars with "Whitney Wonder" roller-bearing wheels are employed.

Franklin County is finding that where the shafts are of such a depth and of such a tonnage as here obtains the ordinary unconed drum has too high a peak load and does

not afford sufficient speed. For this reason at both Nos. 9 and 8 mines special conical drums are being provided. These drums begin the hoist easily and rapidly speed it up when the load is started. They then maintain that higher speed till the steam is shut off. The new drums are of Nordberg Manufacturing Co. make, but the hoists were supplied by the Litchfield company. Thus at No. 8 mine, the second operation visited, the present hoisting limit seems to be 5500 tons per eight-hour shift, but with the new hoisting arrangements it is expected that the tonnage will be raised to 6500 tons. To secure this not only is the drum being changed, but the old 24 x 42 in., Litchfield hoist is being replaced by a 28 x 48 in. hoist of the same make. The new drum has a speed ratio between slow and fast speeds of 7 to 11.

## A DIFFERENCE IN DEPTH EXISTS

At the present writing No. 9 is not so large a producer as No. 8, which is older. It has a capacity of 5000 tons a day. At No. 8 the shaft depth is 450 ft. and at No. 9, 460 ft.

Since permissible powders have been introduced the safety of the mines has been greatly increased. No longer does shotfiring ignite the coal; consequently there is only one mine of the Old Ben Corporation where firerunners are now employed to follow the shotfirers and to extinguish the fires started. The company would change the explosive used at that mine if it were not for the firm determination of the men to require its use.

Rooms are driven 24 to 28 ft. wide and are spaced on 40 to 45 ft. centers. Crosscuts are driven 60 ft. apart. To save expense these are made 18 to 20 ft. wide, thus taking away about a quarter of the strength of the 16 to 17 ft. pillar between the rooms.

The haulage system at No. 9 mine is quite unusual, especially where so large a tonnage is attained. The small six-ton electric locomotives, of which from 12 to 15 are always in use, come to the landing with their trips. They do not act as secondary haulage units but take the coal from the working headings all the way to the shaft. So many locomotives arriving at one and the same point might be expected to interfere with one another, but so excellent is the signaling system that this difficulty is entirely avoided and the use of the many small units provides a steady flow of coal. This plan might not be possible at many mines, but it works out quite well at No. 8, where the grades are light.

## ORIENT ALSO HAS A STORAGE YARD

The next operation visited was the Orient mine of the Chicago, Wilmington & Franklin Coal Co. This mine has a storage yard well away from the plant, the coal stored (which is not merely of small sizes but run of mine), being transported in Western dump cars from which it is discharged in the ordinary manner and transferred to big piles by two Link-Belt Machinery Co. shovels having 2-yd. buckets and 50-ft. booms.

The Orient mine is deeper than either of those just described. The coal dips toward the north, and the Orient mine is north of West Frankfort. The depth of the shaft is 520 ft. from the top of the ground to the top of the coal. The total hoist is 600 ft. (at Valier, a mine still further north, the depth of the shaft is 605 ft., the mine floor at that point being roughly 200 ft. below the sea level). The cages at the Orient mine are of the self-dumping type manufactured by the Eagle Iron Works, of Des Moines, Iowa.

Lunch was served in one of the houses in the village of Orient, and the party then took train to Valier where the main shaft was being operated, this being its first day's run. Here is installed an electric hoist and no coned drum. With this electric hoist there is a large flywheel to meet the peak load, and perhaps it is unnecessary to cone drums in such an instance in order to keep down a peak that is already well provided for.

Provision is made at Valier for a suitable rope speed through the use of a 12-ton skip, which saves in the weight to be lifted and reduces the speed by the large capacity raised at each hoist. This skip was built by the Connellsville Machinery Co., which also supplied the 14 x 5 ft. fan which is now producing 200,000 cu. ft. of air and is capable of delivering 300,000 cu. ft. against a 3-in. water gage.

Valier is a pretty little town. The company owns only 125 of the 400 houses, but it has installed an ample supply of pure water, electric lights and sidewalks, and is now prepared to sell lots to all who desire to locate there. Other persons beside the Valier Coal Co. also have lots, and the mine officials are glad to have their men purchase either of the company or of others in the field.

Though the Valier Coal Co., being railroad-owned, is sure of a steady run and favorable conditions for the earning of substantial and steady wages, the company in its little booklets is calling attention to the fact that "six of the largest mines in southern Illinois are located within a radius of 3 miles" quite a modest distance in these days of miner-owned automobiles.

## DWELLING MAY BE PURCHASED

The Valier Coal Co.'s building plot alone comprises 120 acres. Every one of the 125 houses built by the company is held for sale at cost to any employee in a single payment or in installments with 6 per cent. interest per annum on outstanding balances computed monthly. Every man should be able, says Mr. Scholz, to pay for his house in less than three months time.

The party went down into the mine to see the Jeffrey Manufacturing Co.'s heading machine, which makes two shear cuts and one undercut and then wedges the coal down by heavy horizontal blows with several picks. It takes three cuts to complete the full heading width. The machine can easily make 12 ft. per day and sometimes as much as fifteen feet.

After a long trip through the mines the party came to the surface and took train to Benton, where automobiles were taken for a distance of about 2 mi. to the mine of the United States Fuel Co., a subsidiary of the United States Steel Corporation. This mine is known as Middle Fork, and it has a washery which has many new features that cannot now be described.

There are here employed many large belt conveyors, built by the Robins Conveying Belt Co., in one of which the belt is 7 ft. wide. The jigs are built by the Pittsburgh Washery Co. Centrifugal dryers of the Elmore type and Dorr Thickeners are interesting units of the same installation. The plant was idle on the occasion of the visit, and the guests were able to make the trip without discomfort.

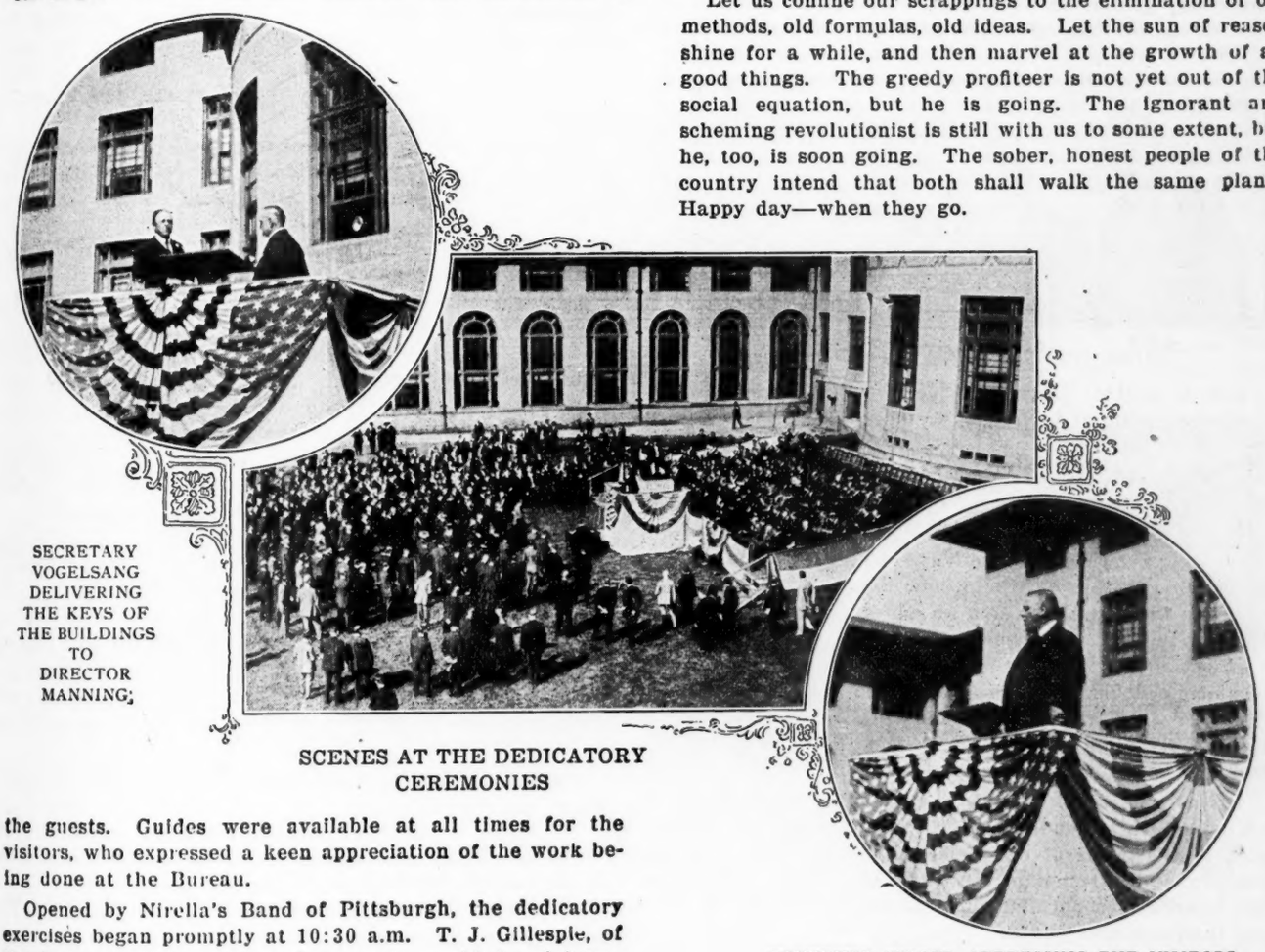
This mine has an electric hoist and a double-cone drum. Its output has so far not exceeded 3000 tons per day. After a bounteous meal at Jedd's Cafe, the party returned to the special car by which they had originally arrived at Benton, which being attached to the regular night train to Chicago landed them the next morning at the Dearborn Street Station. It was in every way a notable trip and full of interest, and many thanks are due to Mr. Scholz, the Old Ben Corporation, the Chicago, Wilmington & Franklin Coal Co. and the Valier Coal Co. for the way in which it was carried out, and the generous manner in which information was supplied.

# Dedication of Bureau of Mines Buildings

A CROWD of over 200 persons, including several distinguished visitors of national reputation, witnessed the dedicatory ceremonies at the new Bureau of Mines buildings at Pittsburgh on Sept. 29. The structures, begun over three years ago and but recently completed, cost the Government $1,000,000. The dedication services were delayed by the war and the confusion resulting from the signing of the armistice.

A stand was erected within the large court in the rear of the buildings. Some of the visitors occupied seats in the stand while others grouped themselves in a wide semicircle around it. The day was ideal as far as weather conditions go, and the entire program was carried out without a hitch, although three of the men who were to have made addresses were not able to be present. They were Hon. Franklin K. Lane, Secretary of the Interior, John L. Lewis, acting president of the United Mine Workers of America, and Horace V. Winchell, president of the American Institute of Mining and Metallurgical Engineers.

Early in the morning the buildings were thrown open for inspection and souvenir booklets were distributed to the guests. Guides were available at all times for the visitors, who expressed a keen appreciation of the work being done at the Bureau.



SECRETARY VOGELSANG DELIVERING THE KEYS OF THE BUILDINGS TO DIRECTOR MANNING;

SCENES AT THE DEDICATORY CEREMONIES

GOVERNOR SPROUL ADDRESSING THE VISITORS

Opened by Nirella's Band of Pittsburgh, the dedicatory exercises began promptly at 10:30 a.m. T. J. Gillespie, of the Pittsburgh Chamber of Commerce, presided and introduced Chancellor S. B. McCormick, of the University of Pittsburgh, who gave the invocation. Mayor E. V. Babcock delivered the address of welcome and spoke briefly of the purposes for which the buildings had been erected. He said the reclaiming and saving of human life had already been accomplished though the buildings had not been dedicated. He spoke of the scientific investigation that was part of the Bureau's program, as well as the increase of health, safety and efficiency that had already been noted. In the work being done at the Bureau, the coöperation of the city had ever been assured. In closing, Mayor Babcock extended to the visitors the hope that their visit in Pittsburgh would be pleasant, profitable and instructive. In giving them the freedom of the city, he said he offered all that any city has to offer anybody.

The response to the address of welcome was made by the Assistant Secretary of the Interior. Alexander T. Vogelsang, who said:

> The United States has had all the fighting and all the violence it wants for quite a while. It now wishes to get the war settled—to have peace proclaimed. It wants to build and produce. Four years of war and of grief have been enough—more than enough. Let us, in heaven's name, now have just one year of industrial peace. If we get it, this day twelvemonth will show us to be the happiest and most prosperous people en masse in all the world. It is not asking too much of capital to grant this brief respite, nor too much of labor. Let this country once again get the pulse beat of peace; she craves it beyond all other things.
>
> Let us confine our scrappings to the elimination of old methods, old formulas, old ideas. Let the sun of reason shine for a while, and then marvel at the growth of all good things. The greedy profiteer is not yet out of the social equation, but he is going. The ignorant and scheming revolutionist is still with us to some extent, but he, too, is soon going. The sober, honest people of the country intend that both shall walk the same plank. Happy day—when they go.

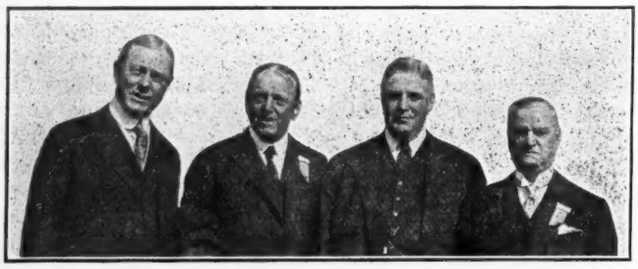
In closing, Mr. Vogelsang read a message from President Wilson to Secretary Lane, as follows:

> I wish that I might be present to express my very deep interest in the work being done by such instrumentals, for the increase of production, the safeguarding of life, the raising of the standard of living and scientific endeavor. It is a very happy circumstance that with this meeting should be the ceremonies connected with the new building in Pittsburgh of the Bureau of Mines."

Hon. William C. Sproul, Governor of Pennsylvania, followed Mr. Vogelsang making an address in which he refused to discuss the steel strike. Before he began his talk he declared smilingly that he "had said his say on the strike" and stated that he had come "to express the gratification of Pennsylvania for the splendid enterprise brought into being by the American Government."

"There has been no doubt of where it should be located," he added, "yet Pittsburgh should be proud to possess it. This is the heart of the coal industry. Though it is true that as the years have passed Pennsylvania has fallen behind other commonwealths in production of iron ore, oil and gas, yet in coal she produces three times as much as any other three states combined."

Toward the success of the local institution, the Governor pledged the coöperation of the state. He called attention to the fact that men educated and trained in Pennsylvania schools were holding enviable positions in mining areas the world over. The Governor said that he was much interested in housing and welfare conditions at mining communities, and that it was impossible to make good citizens out of children who were raised in squalid localities and in unsanitary homes, no matter how safe the mines were and how farsighted the operators might be. Governor Sproul



SOME OF THE NOTABLES PRESENT

Left to Right: Mayor Babcock, Secretary Vogelsang, Governor Sproul and Director Manning.

also mentioned the new Bureau of Rehabilitation, in which men crippled in industries were reëducated and prepared to once again take their place in various industries.

In the absence of Horace V. Winchell, president of the American Institute of Mining and Metallurgical Engineers, J. Parke Channing delivered an address on the labor problems of the day. He spoke of the new course in human engineering that is being included in the curricula of many technical schools, and said that a mine foreman was better equipped if he had a knowledge of his men than he was if his only ability consisted in being able to tackle the technical problems which confronted him.

It was a mistake, he said, to explain the wage system as an outgrowth of feudalism, for it was the natural developmen of the needs of our human relations. He compared the available earnings of the world to a stock of money in the interior of a pot and said that no more could be taken out than had been put in.

Stating that the income of the country was, in 1916, probably about $50,000,000,000 per year, he added that at least $40,000,000,000 of that income were turned back in wages; the rest might be divided between the profit made by capital and the reward to those who toil with their brains. He added that without the other $10,000,000,000 there would be no social progress, no improvement in railroads and other public conveniences. It was necessary that some of the earnings of the world at large should be devoted to new construction.

Were profits and awards for management annulled, Mr. Channing said, the workingman's wage would be only slightly increased. The workingman whose wage in 1916 averaged about $1000 a year would have obtained only $1250 if the brain workers had received no wages for their toil and capital had drawn no compensation for the use of the savings it had put by.

Following Mr. Channing, Van A. Bittner delivered an address in place of John L. Lewis, acting president of the United Mine Workers of America, who was at that time, busy endeavoring to obtain a new contract from the coal operators at a meeting held in Buffalo. Mr. Bittner spoke most favorably of the work and purposes of the United States Bureau of Mines and quoted figures to show how the mine-accident death rate had been decreased since the Bureau had been established. Mr. Bittner pointed to the patriotic assistance given the nation during the war by the Bureau of Mines, declaring that the buildings had, temporarily, been transformed from their death-saving purposes to one of death dealing.

He also spoke of the developments in the art of making gas and gas masks for war purposes, all of which changes in technique were the outcome of the investigations of the Bureau of Mines during the period of the war. He advocated that the United States Government undertake to regulate by Federal supervision the operation of the coal mines, so that every section of the country would be subjected to similar laws relative to the conservation of health and life in the mines.

The ceremonies were brought to a close with the handing over of the keys to the building by Secretary Vogelsang to Van H. Manning, director of the station.

E. A. Holbrook, secretary of the Pittsburgh Chamber of Commerce, then explained the program for the rest of the day, after which the crowd dispersed.

Luncheon was served at the Bureau buildings after the exercises. At two o'clock, a special train from a siding near the Bureau carried the visitors to the experimental mine near Bruceton, Penn. Arriving at the mine, the various devices for the determination of the strength, shattering effect, gaseous products, sensitiveness, liability to freezing, etc., of explosives were demonstrated. Among these different devices are included the ballistic pendulum, Bichel gages, Mettegang recorder and gas and dust galleries.

At 3:45 p.m. an explosion of coal dust was made in the mine. This was accomplished by placing pulverized coal on cross shelving overhead and on floor and side shelves. Two pounds of dust per foot of entry were applied. A cannon loaded with 3 lb. of FFF black powder was located on the floor of the entry, 225 ft. from the drift mouth, pointing outward. A solid wall of flame followed the firing of the cannon, after which the fan was put in operation and the air in the mine cleared.

Rock-dust barriers were inspected after the explosion. These were trough-shaped and illustrated the single and concentrated types. The barriers were then demonstrated. A demonstration of liquid oxygen as an explosive was given in the blowing up of a tree stump on the grounds.

The geophone was demonstrated to the visitors. The geophone is a device for locating the position of imprisoned miners and was used to considerable advantage in the war by the sapper engineers. A 25-lb. keg of black powder was exploded by passing an electric current through the metal container. In demonstrating the danger from the flame of open lamps coming in contact with kegs containing black powder, a keg of this explosive was fired by this method. Powder was then wrapped in paper containers and placed inside a metal keg, and an open lamp placed under the keg. An explosion followed after four minutes.

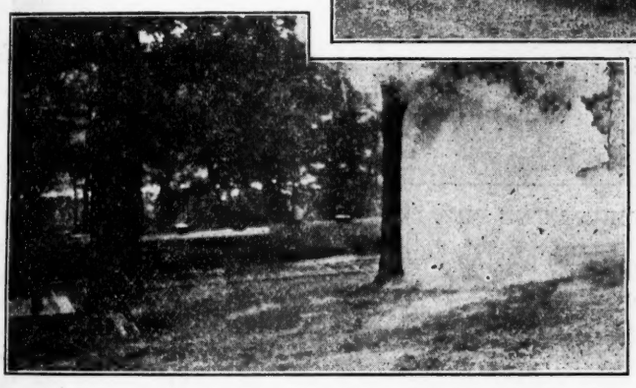
An automatic switch thrower, selective or flying, manufactured by the American Mine Door Co., of Canton, Ohio,

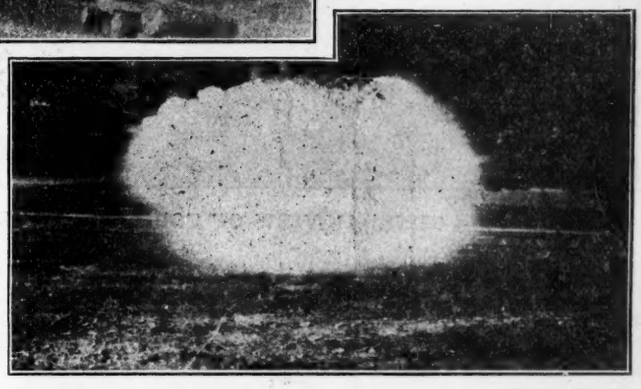
received more than passing notice from the visitors. A model was available as well as the actual working device.

At 6 p.m., the visitors boarded the train for Pittsburgh and were taken to the Baltimore & Ohio station. In the evening, at 8:15 p.m., a mingled program of organ music and speeches was held at the Carnegie Music Hall, Charles Heinroth, director of music at the Carnegie Institute, being the organist. Addresses were made by Samuel Harden Church, Alexander T. Vogelsang, Assistant Secretary of the Interior, and Dr. Van H. Manning, Director of the Bureau of Mines.

Mr. Church's remarks, both jocular and serious, were received with much approval. In serious mood he referred to the Plumb plan and said that even now the workmen were in charge of the railroads, referring to the humble positions from which the presidents of the four biggest railroad systems had sprung. He declared that if the Bolshevists had their day and displaced these men, they would have to take others from the ranks to fill the places of those dispossessed, and that these men, recruited from the same ranks and performing the same services, would be in no wise more truly workingmen than those now in charge, only they would be less experienced, chosen with less consideration of fitness and selected more on the spur of the moment, and therefore would be men who would inadequately fill the places of those they displaced.

He added that it was not true that the poor were growing poorer. Every day's sun set on a people who were better nurtured and more comfortably housed than the people on whom the sun arose. The progress from the ragged edge of poverty to comfort and competence was almost without a break in its continuity.





SCENES FROM THE DEMONSTRATIONS AT THE EXPERIMENTAL MINE

Upper: Looking toward the drift mouth after the coal dust explosion. Lower left: A 25 lb. keg of black blasting powder exploded with unexploded keg at left in foreground. Lower right: Explosion of a 25 lb. keg of FFF black blasting powder by allowing an electric current to pass through the metal container of the keg.

Alexander T. Vogelsang dropped most of his speech into the desk in front of him. Not having the key of that desk or one of the Bureau of Mines' geophones, it is impossible to record much of what he said. In somewhat fuller voice, however, he was heard to say that he much deplored the recent strife of war with its destruction of life and its waste of material resources. He hoped that it would not be followed by a period of industrial strife where the loss to life and comfort would be equally distressing. That man would, Vogelsang added, be a rash and bold prophet who would attempt to foretell all that the next six months portended, but he trusted that, remembering how short was the stock of all things on which the life, health and comfort of the world depended, we would declare a six month's industrial truce which would at least carry us through the perilous period of winter.

Dr. Van H. Manning, after a word of praise of Joseph Austen Holmes, his deceased predecessor, addressed the members of the mine-rescue and first-aid teams asking them to be patient about the decisions reached by the judges in the coming meet. All could not be winners; mistakes were bound to occur, but like sportsmen we must meet all the unavoidable difficulties inherent in a contest such as that about to be staged.

Adjourning to meet in the Carnegie Lecture Hall, the audience listened to James W. Paul and inspected the slides and motion pictures taken by the Bureau of Mines in coöperation with the National Coal Association. The latter organization has provided the $25,000 necessary to prepare these screen reproductions of coal-mining scenes, which are grouped together under the title "The Story of Coal."

Many picturs of the underground have been taken before. The mining public has been in the habit of expressing itself highly pleased with these films, but now at last it can so deliver itself without any mental reservations. Daylight could hardly give better results. A little smoke from the carbon arc appears in the mine scenes and looks like steam, but that adds beauty, if not truth, to the pictures and certainly obscures nothing of importance.

The views taken on the roadways from a traveling platform will certainly be extremely illuminating to the general public. The mines chosen, if one may hazard a guess, are those which the American Institute of Mining and Metallurgical Engineers have just been visiting in Franklin County, Ill. One could recognize No. 9 mine of the Old Ben Corporation, Orient and Middle Fork. Other pictures are to be taken all over the coal fields of the United States, and the public is to be made aware of the many and expensive operations which precede and accompany the extraction of this fuel. For although coal is one of the commonest of all commodities, being probably outranked in this respect by flour and sugar only, the public at large has but small conception of just how it is produced, sized and prepared for consumption.

# Mine-Rescue and First-Aid Contest in Pittsburgh

**SYNOPSIS:—In spite of some inclement weather, much enthusiasm was displayed in the national meet. Many teams, both mine-rescue and first-aid, were entered and competition was keen. As a region, the West apparently showed greater proficiency than the East, although the East took first place.**

ON TUESDAY, Sept. 30, from 9 to 12 a.m., the preliminary mine-rescue contests of the national first-aid and mine-rescue meet held in Pittsburgh, Penn., in conjunction with the dedication of the Bureau of Mines buildings there, were conducted at Forbes Field. Twenty-one teams, representing eight states, competed in a specially constructed wooden gallery, a portion of which was inclosed and served as a gas chamber into which formaldehyde fumes were introduced. Music by Nirella's band kept the small but appreciative crowd in a good humor.

The following problem was given each team: "Following a mine fire, crew proceeds to nearest working place. A miner is found unconscious, canary has been overcome en route—remove the miner to outside and revive by artificial respiration. Time, 19 minutes." The various teams went to work in a grim, methodical manner that was impresive and suggested the idea that real lives were at stake instead of the dummies which were used. A touch of human interest was brought out by one of the team captains who refused to take a live canary into the gas chamber. Finally a dummy bird was given him, after which he entered into the competition. Another incident of interest was the fainting of one of the team members while in the gas chamber. However, he was brought safely to the outside before any serious effects from the fumes had resulted.

The judges were William Nesbit, chief mine inspector of the Keystone Coal and Coke Co., of Greensburg, Penn.; Edward Steidle, of the mining department of the Carnegie Institute of Technology; R. Z. Virgin, of the mining department of the Carnegie Institute of Technology, and W. G. Duncan, from the mining department of Pennsylvania State College. Edward H. Cox, general manager of the Snowden Coke Co., of Braznell, Penn., acted as chief judge.

From this competition, ten teams won entry to the finals on the following day: McDonald Mine of the Carnegie Coal Co., of Pittsburgh, Penn.; Buffington Rescue Station of the H. C. Frick Coke Co., of Pittsburgh, Penn.; Leisenring No. 1 Rescue Station of the H. C. Frick Coke Co., of Pittsburgh, Penn.; Hillman Coal and Coke Co., of Brownsville, Penn.; Inland Collieries Co., of Harmarville, Penn.; Orient Central Rescue Station, Team No. 1, of Orient, Penn.; Pittsburgh Terminal Railroad and Coke Co., of Pittsburgh, Penn.; Union Coal and Coke Co., of Bentleyville, Penn.; Washington Coal and Coke Co., of Star Junction, Penn.; Madison Coal Corporation, of Carterville, Ill. These teams were selected from a field of 21 that included teams from Alabama, Indiana, Montana, Virginia, Washington and West Virginia.

In the afternoon the preliminary first-aid contests were held on the same field that saw the endeavors of the mine-rescue men. Eighty-five teams were entered, out of which 20 were selected for the world's series on the day following. Five full-team problems were given the various teams, with Major M. J. Shields, of the American Red Cross, serving as chief judge. Practically all of the judges were selected from among prominent physicians of the Pittsburgh district. A considerable number of ties for various places resulted, as was to be expected, all of which were run off after the competition proper. Five teams were tied for 20th place. A limited amount of time was allotted to each problem and the teams were penalized for failure to finish on time. A larger crowd was present than during the rescue work in the morning and saw the following teams place for the finals:

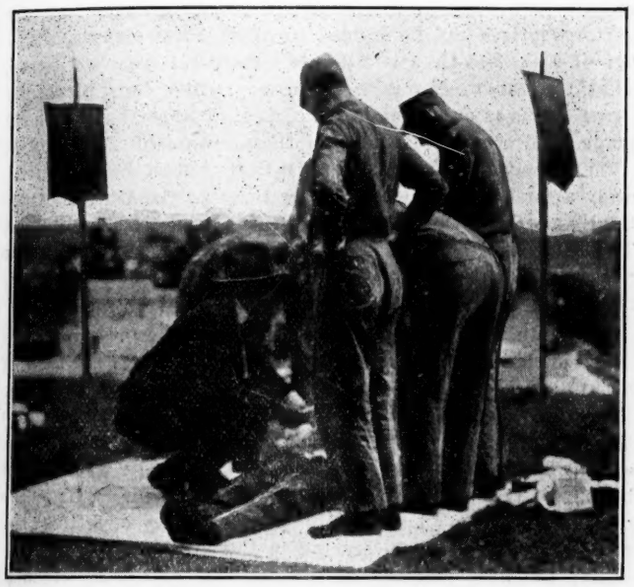
GENERAL VIEW OF FORBES FIELD DURING THE PRELIMINARY CONTEST

Superior Coal Co., of Gillespie, Ill.; Ronco Mine of the H. C. Frick Coke Co., of Ronco, Penn.; Mine No. 6 of the Pittsburgh Terminal Railroad and Coke Co., of Bruceton, Penn.; Consolidated Coal Co., of Jenkins, Ky.; Roslyn Fuel Co., of Seattle, Wash.; Butte District, of Butte, Mont.; Rachel Mine of the Bertha Coal Co., of Broomfield, W. Va.; Mine No. 6 of the J. K. Dering Coal Co., of Clinton, Ind.; Mine No. 42 of the Davis Coal and Coke Co., of Kempton, W. Va.; Standard Mine of the H. C. Frick Coke Co., of Mt. Pleasant, Penn.; Primos Chemical Co., of Vanadium, Colo.; Colliery No. 11 of the Penn Coal and Coke Corporation, of Cresson, Penn.; Sonman Shaft Coal Co., of Portage, Penn.; United States Coal and Coke Co., of Gary, W. Va.; United States Fuel Co., of Universal, Ind.; Vesta No. 7 Mine of the Vesta Coal Co., of West Brownsville, Penn.; Madison Coal

Corporation, of Carterville, Ill.; Team No. 1 of the Penn-Mary Coal Co., of Heilwood, Penn.; Berwind Mine of the Colorado Fuel and Iron Co., of Pueblo, Colo.; Team No. 2 of the Rembrandt Peale Interests, of St. Benedict, Penn.

In the evening, at 8:00 o'clock, a pageant entitled "The Hidden Treasures of the Earth" was presented by the Pittsburgh Chamber of Commerce at Forbes Field. The production was under the direction of the author, Thomas Wood Stevens, president of the American Pageant Association, who lived up to his reputation as one of the foremost producers of pageants in America. It was by far the most dramatic event of the three days and was thoroughly enjoyed by a crowd of about 5000 people. An imitation, miniature coal-dust explosion was enacted that brought the audience to its feet through its realism.

The spirits of Earth, Fire, Air and Water were represented as conspiring against the dreamer Man in the beginning of the world. The successive steps in the development of the mining industry were shown through periods that represented the ages of bronze, gold, iron and finally coal. The last episode, that of coal, portrayed events in the progress toward the safety of life in coal mining which



FIRST-AID TEAM OF THE ROSLYN FUEL CO. SEATTLE, WASH.

was assumed to begin with the invention of the safety lamp. Permissible explosives were introduced as part of the new methods, and lastly the methods of first-aid and mine-rescue. The final act saw the vision of the Man of Science gaining dominance over the forces of Nature.

The acting of the participants, all of whom were amateurs, was good, and the work of the dancers in particular was to be commended. The cast was drawn from students of the University of Pittsburgh, Carnegie Institute of Technology and men from the many first-aid and mine-rescue teams. Lighting effects were carefully planned and gave a pleasing impression.

### THE DOINGS OF WEDNESDAY

In the face of a drizzling rain, the finals of the mine-rescue competition were run off at Forbes Field. Though the inclemency of the weather dampened the action to some extent, yet the final contest saw some of the keenest competition that has ever characterized an event of this nature. The same judges who handled the contest on the day previous were officiating at the finals. The following problem was given each of the ten teams: "Enter mine after explosion, remove stopping across roomneck, find man under fall of slate in fresh air back of barricade with severe cut on lower left leg. Treat and rescue. Time, 12 min."

The following three teams finished first, second and third in the finals, and in the order named: Acme Mine No. 2 of the Union Coal and Coke Co., of Bentleyville, Penn., captained by Mark Jones. Average 99 per cent. No. 1 Team of the Leisuring Rescue Station of the H. C. Frick

WORLD'S CHAMPION FIRST-AID TEAM

Coke Co., of Pittsburgh, Penn., captained by Patrick Bradley. Average, 98 per cent. Buffington Rescue Station of the H. C. Frick Coke Co. of Pittsburgh, Penn., captained by Frank Hyde.

Considerable trouble was experienced by some of the teams due to the wet and slippery condition of the stretchers. This, however does not mean that any credit should be taken from the winners, who performed their duties best under adverse conditions. So to the team of the Union Coal and Coke Co. goes the honor of being the champion mine-rescue team of the United States.

In the afternoon, the first-aid teams, 21 in number, assembled for the big event. The twenty-first team was represented by the Wisconsin Steel Co., of Benham, Ky. which arrived too late for the preliminary contest on the previous day. They competed merely for a place in the meet standing, though they were barred from any of the prizes.

Before the contest started, Van H. Manning, director of the Bureau of Mines, read the awards of the Joseph A. Holmes Safety Association, which was established in 1916. The purpose of the association is to perpetuate the memory of the humanitarian work of Dr. Holmes, first director of the Bureau of Mines, and to further encourage organized

VIEW OF THE FIELD DURING FINAL CONTEST

efforts for greater safety in mining. The awards as made, apply to men who voluntarily risked their lives to rescue miners entombed after a mine fire or explosion. The heroes are as follows: Lewis Meredith Jones, Pittsburgh, Penn., died; Samuel Hardy, Dunbar, died; Clyde Foltz, Dunbar, died; Michael Softcheck, Frank Crum, August Klaus, Orient, Penn.; Neal Brennan, Manus Dugan, William C.

Mitchell, Butte, Mont., died; Granite J. Frowen, Thomas Cooney, Butte, Mont.; John C. Farmer, Havaco, W. Va., died; George Washington Keith, Havaco, W. Va.; Henry Clay Turner, Maitland, W. Va.; Adam B. Mitchell, Fort Gay, W. Va; Samuel Jones, Speedwell, Tenn., died. Gold medals and diplomas were awarded to the heroes. In the event of the hero himself giving up his life, the award went to his nearest relative.

The weather cleared by the time the gong sounded for the first event. Approximately 1000 persons were seated in the grandstand during the contest. Five full-team problems, as in the day previous, constituted the program, which was as follows:

TYPE OF GOLD WATCH-FOB GIVEN BY "COAL AGE" TO STATE CHAMPIONS OF THE STATE OF ALABAMA IN THE FIRST-AID CONTEST HELD AT PITTSBURGH

1. Treat a man insensible from gas and smoke. Schaefer or Sylvester method of artificial respiration must be used. Time, 5 min.

2. Punctured palm of right hand, right collar bone broken, right ear torn off, seventh and eighth ribs on right side broken. Treat and carry on improvised stretcher. Time, 10 min.

3. Dislocation of right shoulder; left knee cap broken; left eye ball injured. Treat. Time, 8 min.

4. A man is overcome by heat exhaustion and falls, fracturing skull and breaking left arm. Treat Time, 8 min.

5. Miner ignites gas with open light and receives burns on entire body above waistline. This includes head, face, neck, upper extremities, chest and back. He is conscious, but there is evidence of shock. Treat Time, 10 min.

The crowd was appreciative at all times and frequently applauded some noticeable presence of mind or speed on the part of a team or team member. The competition was spirited, but in the end the Standard Mine of the H. C. Frick Coke Co., of Mt. Pleasant, Penn., finished first with the remarkable percentage of 99.6 for the five events. Second place was won by the Butte District Team from Butte, Mont., with the splendid percentage of 99.2. The first five teams with their captains are as follows and in the order named: The Standard Mine of the H. C. Frick Coke Co., of Mt. Pleasant, Penn., Captain, J. C. Spence. Butte District Team, of Butte, Mont. Captain, Joseph E. Watson. Roslyn Fuel Co., of Seattle, Wash. Captain, William J. Evans. Berwind Mine of the Colorado Fuel and Iron Co., of Pueblo, Colo. Captain, David Aitken. Colliery No. 11 of the Pennsylvania Coal and Coke Corporation, of Cresson, Penn. Captain, Harry Davis.

When the fact is noted that Pennsylvania had over eight times as many teams entered as any other single state, or more than all of the other states put together, it must be conceeded that the teams from the visiting states did well. The Roslyn Fuel Co. team that captured third place is the same one that was given first place in the meet held in 1911. How close they came to twice carrying off the national prizes can be judged by their noteworthy percentage of 98.2, less than two points behind this year's winners. That the far west was represented in the four places by three teams is sufficient proof of the advance that has been made in first-aid treatment in that section of the country.

In the special artificial respiration contest held immediately after the first-aid finals the team of the United States Coal and Coke Co., of Gary, W. Va., received first place. The team is captained by F. S. Hoch. With it went the possession of the silver cup of the Life Saving Services Co., of Chicago.

Following the contests, a coal-dust explosion was staged in a wooden gallery on the field. This was a duplicate of a similar explosion at the same time on the day previous. Pulverized coal dust was placed in shelving throughout the gallery, much in the same manner as was done at the experimental mine near Bruceton. This event was for the benefit of those who were unable to be present at Bruceton on Monday, as well as people from the City of Pittsburgh who are not directly interested in the mining industry.

For the final meeting of the national gathering close to 1000 men crowded into the large room on the second floor of the Chamber of Commerce Building, at a smoker on Wednesday evening. Patriotic songs were sung, impromptu speeches were made and a general spirit of camaraderie that was irresistable filled the atmosphere. H. M. Wilson, of the Associated Insurance Companies of Pittsburgh, officiated. W. L. Affelder, of the Hillman Coal and Coke Co., presented the prizes awarded to the state champions, while B. F. Tillson representing the National Safety Council, presented the prizes to the national winners.

The various prize winners are as follows:

### STATE PRIZES—FIRST AID

ALABAMA—First prize, Debardeleben Coal Co., Sipsey, Ala. Second prize, Republic Iron and Steel Co., Birmingham, Ala.

ARKANSAS—First prize, United Mine Workers of America, District 1116, Paris, Ark.

COLORADO—First prize, Primos Chemical Co., Vanadium, Colo. Second prize, Berwind Mine, Colorado Fuel and Iron Co., Pueblo, Colo.

KANSAS—First prize, Kansas State Team, Pittsburg, Kan.

INDIANA—First prize, United States Fuel Co., Universal, Ind. Second prize, J. K. Dering Coal Co., Mine No. 6, Clinton, Ind. Third prize, Indiana Bituminous Coal Operators Association, Terre Haute, Ind. Fourth prize,

Miami Coal Co., Clinton, Ind. Fifth prize, Vandalia Coal Co., Terre Haute, Ind.

ILLINOIS—First prize, Superior Coal Co., Gillespie, Ill. Second prize, Madison Coal Corporation, Carterville, Ill.

NEW JERSEY—First prize, Raritan Copper Works, Perth Amboy, N. J. Second prize, New Jersey Zinc Co., Franklin, N. J.

KENTUCKY—First prize, Consolidated Coal Co., representing the Kentucky Mining Institute, Jenkins, Ky.

MONTANA—First prize, Butte District Team.

OKLAHOMA—First prize, Folsom Morris Coal Mining Co., Lehigh, Okla.

PENNSYLVANIA—First prize, Ronco Mine, H. C. Frick Coke Co., Ronco, Penn. Second prize, Pittsburgh Terminal Railroad and Coal Co., Mine No. 6, Bruceton, Penn. Third prize, H. C. Frick Coke Co., Standard Mine, Mt. Pleasant, Penn. Fourth prize, Sonman Shaft Coal Co., Portage, Penn. Fifth prize, Pennsylvania Coal and Coke Corporation, Colliery No. 11, Cresson, Penn. Sixth prize, Penn-Mary Coal Co., Team No. 1, Heilwood, Penn. Seventh prize, Vesta Coal Co., Mine No. 7, West Brownsville, Penn. Eighth prize, Rembrandt Peale Interests, St. Benedict, Penn., Team No. 2. Ninth prize, Pittsburgh Terminal Railroad and Coal Co., Team No. 3, Mollenauer, Penn. Tenth prize, W. J. Rainey Co., Revere Works, Uniontown, Penn. Eleventh prize, Oliver & Snyder Steel Co., Oliver, Penn.

TENNESSEE—First prize, American Zinc Co., Mascot, Tenn.

VIRGINIA—First prize, Clinchfield Coal Corporation, Dante, Va. Second prize, Stonega Coke and Coal Co., Stonega Colliery, Big Stone Gap, Va.

WASHINGTON—First prize, Roslyn Fuel Co., Seattle, Wash.

WEST VIRGINIA—First prize, Davis Coal and Coke Co., Mine No. 42, Kempton, W. Va. Second prize, Bertha Coal Co., Rachel Mine, Broomfield, W. Va. Third prize, United States Coal and Coke Co., Gary, W. Va.

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NOTE—The winning first-aid team from each of the states mentioned above received a streamer signifying that it held the championship of its respective state.

### STATE PRIZES—MINE RESCUE

ALABAMA—First prize, Republic Iron and Steel Co., Birmingham, Ala.

INDIANA—First prize, Knox County Coal Operators Association, Indianapolis, Ind.

ILLINOIS—First prize, Madison Coal Corporation, Carterville, Ill. Second prize, Herrin State Mine Rescue Team, Herrin, Ill.

WASHINGTON—First prize, Roslyn Fuel Co., Seattle, Wash.

WEST VIRGINIA—First prize, United States Coal and Coke Co., Gary, W. Va.

PENNSYLVANIA—First prize, Leisenring No. 1 Rescue Station, H. C. Frick Coke Co., Pittsburgh, Penn. Second prize, Hillman Coal and Coke Co., Brownsville, Penn. Third prize, Buffington Rescue Station, H. C. Frick Coke Co., Pittsburgh, Penn. Fourth prize, Washington Coal and Coke Co., Star Junction, Penn.

MONTANA—First prize, Butte District Team, Butte, Mont.

### NATIONAL PRIZES

One silver cup, donated by the National Safety Council—First prize, first-aid team winning national championship. Won by H. C. Frick Coke Co., Standard Mine, Mt. Pleasant, Penn. Captain J. C. Spence.

One silver cup, donated by **Coal Age**—First prize, first-aid team winning national championship. Won by H. C. Frick Coke Co., Standard Mine, Mt. Pleasant, Penn. Captain J. C. Spence.

One silver cup, donated by **Coal Age**—First prize, mine-rescue team winning national championship. Won by Union Coal and Coke Co., Acme No. 2 Mine, Bentleyville, Penn. Captain Mark Jones.

One gold cup, donated by **Coal Industry**—First prize, mine-rescue team winning national championship. Won by Union Coal and Coke Co., Acme No. 2 Mine, Bentleyville, Penn. Captain Mark Jones.

One silver trophy cup, donated by Life Saving Devices Co., Chicago, Ill., to first-aid team attaining best record in artificial respiration and held until next national contest. To be awarded to first-aid team attaining highest rating in resuscitation problems on final days contest. Won by United States Coal and Coke Co., Gary, W. Va. Captain F. S. Hoch.

Gold medals of National Safety Council to each member of team winning first place in national first-aid contest. Won by H. C. Frick Coke Co., Standard Mine, Mt. Pleasant, Penn. Captain J. C. Spence.

Silver medals of National Safety Council to each member of team winning second place in national first-aid contest. Won by Butte District Team, Butte, Mont. Captain J. E. Watson.

Bronze medals of National Safety Council to each member of team winning third place in national first-aid contest. Won by Roslyn Fuel Co., Seattle, Wash. Captain W. J. Evans.

Gold medals of National Safety Council to each member of team winning first place in national mine-rescue contest. Won by Union Coal and Coke Co., Acme No. 2 Mine, Bentleyville, Penn. Captain Mark Jones.

Silver medals of National Safety Council to each member of team winning second place in National mine-rescue contest. Won by H. C. Frick Coke Co., Leisenring Rescue Station, No. 1 Team, Pittsburgh, Penn. Captain Patrick Bradley.

Bronze medals of National Safety Council to each member of team winning third place in national mine-rescue contest. Won by H. C. Frick Coke Co., Buffington Rescue Station, Pittsburgh, Penn. Captain Frank Hyde.

Bronze medals of American Red Cross to each member of team winning first place in national first-aid contest. Won by H. C. Frick Coke Co., Standard Mine, Mt. Pleasant, Penn. Captain J. C. Spence.

Prize certificates of American Red Cross to each member of team winning second place in national first-aid contest. Won by Butte District Team, Butte, Mont. Captain J. E. Watson.

Prize certificates of American Red Cross to each member of team winning third place in national first-aid contest. Won by Roslyn Fuel Co., Seattle, Wash. Captain W. J. Evans.

One camera, donated by B. K. Elliott Co., Pittsburgh, Penn., to captain of team winning first place in national first-aid contest. Won by J. C. Spence of the H. C. Frick Coke Co., Standard Mine, Mt. Pleasant, Penn.

Five Koehler safety lamps, donated by Mine Safety Appliances Co., Pittsburgh, Penn., to team members winning first place in national mine-rescue contest. Won by Union Coal and Coke Co., Acme No. 2 Mine, Bentleyville, Penn. Captain Mark Jones.

Twenty M. S. A. pocket first-aid packets to 20 teams competing in final day's first-aid contest. Donated by Mine Safety Appliances Co., Pittsburgh, Penn. Won by teams in final day's contest.

Watch fobs, donated by Pittsburgh Chamber of Commerce to each competing team member in first-aid and mine-rescue contests.

Banners, donated by Pittsburgh Chamber of Commerce to each competing team in first-aid and mine-rescue contests. One banner only to combination teams.

The end of the smoker marked the conclusion of the biggest event of its kind that has ever been held in connection with the coal-mining industry. Not a single unfortunate incident marred the program of the three days, with the exception of a little rain on Wednesday morning. Everything came off according to schedule and in a manner that showed careful preparation and foresight. The officials of the Bureau of Mines are to be commended for the absolute success of the undertaking, as are also the Chamber of Commerce officials and the various men of the Pittsburgh district who served faithfully on the different committees. It is too early to hope that such a program may become a yearly event. From the amount of enthusiasm aroused in first-aid and mine-rescue, the Bureau of Mines considers the work involved well worth the effort. That safety in mining has been given a tremendous impetus there is little doubt.

# Safety Men Meet at Cleveland

By R. Dawson Hall
Managing Editor, *Coal Age*

IN THE first two days of the Eighth Annual Safety Congress of the National Safety Council, held Oct. 1 to 4 at the Hotel Statler, Cleveland, Ohio, over 2100 persons registered. Probably 3000 people attended the sessions and many more witnessed the great safety show.

To the bona fide participants might be added the whole population of Cleveland, which watched the parades and read the bulletins, heard addresses in the public, high and parochial schools, listened to talks in the factories and were taught safety in sermons delivered on Sunday in the churches.

Safety bulletins took prominent places in store windows. The emblem of the Council brightened prominent points on buildings. Slogans on safety were displayed by department stores. Twenty clubs gave consideration to safety at luncheons and meetings. Street cars, municipal vehicles and all automobiles carried the story to the public. The police wore special buttons and held daily demonstrations. The fire Department was no less active.

DAVID VAN SCHAAK,
Retiring President

Every safety zone on the streets bore a safety message that was freshly painted each night. A safety section appeared in all the Sunday newspapers on Sept. 28. An accident clock was erected whereby to compare the fatalities in Cuyahoga County (the county in which Cleveland is situated) during "Safety Week" with the number of deaths that occurred in the same week a year before. Even the stoppers of the milk bottles delivered to the numerous patrons of the dairies during the week carried the story of safety conspicuously displayed.

These details are enumerated here so that the reader can take the matter to heart and try to work up a similar annual drive in his own community. It can be done everywhere, in a measure, and it will create a sentiment for safety that cannot be excelled. St. Louis and Cleveland are hardly mining centers, and the safety drives at those places will not do much good in mining communities; but the example so set can be transferred to real mining cities. Miami, Ariz., a small metal-mining city, is doing it already.

Why cannot towns like Scranton, Wilkes-Barre, Hazelton, Pottsville, Pittsburgh, Terre Haute, Springfield, Birmingham, and Jellico, to mention a few at random, do the like? They could, and they soon will. Safety is only to be attained by making it universal.

The breadwinner must not be the only one interested. He is apt to be a bit selfish. He figures that so long as he lives he will earn enough to provide for his support; when he's dead he doesn't need a living any longer, so why worry? Mother and the children don't see it that way, and they are more interested than he is. Altruism "does not go very far" with the careless man, and to get his coöperation it is necessary to bring a little pressure to bear on him through his wife and family.

We go on "bulletining" the workman at the mines, and only at the mines regardless of these facts. The store carries no message to his wife. There is no bulletin in the office. We try to get the mine worker's fleeting attention when the man-trip is waiting or he is hurrying home, and we forget to indoctrinate him when he is idle and waiting; and we overlook his family altogether.

Safety should come to him, not alone with the rattle of the tipple or the stench of the return air of the mine, but everywhere—at the store, the school, the church and the union hall, where he idles as well as where he works, wherever he congregates.

There are no engineers' meetings, apparently, as numerously attended as are the meetings of the safety engineers. Strange it is that military, civil, mining, mechanical, electrical, illuminating, railroad and all the 57 vareties of engineers are likely soon to be over-shadowed by the safety engineer.

In no place has he a more certain hold than in the mining profession, for in that work there is a specialized interest, the use of mine-rescue apparatus, and in that industry there are company-owned villages where the corporation is in a large sense responsible for the community life.

One wonders, therefore, why mine-safety engineers are not more actively interested. The metal men here, as in the American Institute of Mining and Metallurgical Engineers, take the lead. They come out in larger numbers to the meetings, talk more fluently, give more useful information, develop more discussion and are more active than the coal-mining men. Most of what they present is of value to all men who work in mines, and it is deplorable that so few coal-mining engineers are present to make use of the valuable information so generously given. In the matter of mine-rescue the metal miners are forging rapidly ahead of the coal miners, and yet the coal industry is not willing to listen to the above developments that the ready purses and active brains of the metal-mine officials are constantly initiating.

The meeting, officially dubbed "annual," took place on the morning of Oct. 1. It opened with an invocation pronounced by Ferdinand Q. Blanchard, president of the Federated Churches of Cleveland, and was followed by an address of welcome delivered by Harry L. Davis, the mayor of the convention city, to which President D. Van Schaack of the National Safety Council responded.

President Van Schaack then read his annual report. He referred to the removal of the Council to larger, and more adequate, offices, the resignation of W. H. Cameron, "that far-seeing enthusiast whose works justified his faith," the appointment of C. W. Price as general manager, "another man of vision and faith, whose administration of his new office has proved, even in a few months, that we made no mistake in advancing him to a field of wider opportunity," the addition to the staff of a new assistant secretary, a new safety engineer, a new librarian, with more assistance, a director of publicity, two regional secretaries and a public-safety field secretary.

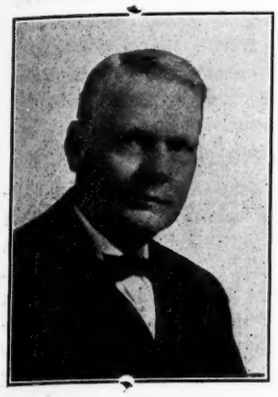
One of the regional field secretaries is W. R. Rasmussen, formerly with the local council at Pittsburgh who did a great deal for the coal-mining communities. Mr. Van Schaack declared that one Safety Practices Bulletin was produced every month last year as against eight in the course of the whole year before and sixteen Executive Series Bulletins were issued relative to industrial relations.

Mr. Van Schaack reported that the local councils at Pittsburgh, St. Louis and Rochester are now well established with a permanent secretarial, and that they are doing excellent work. The local-council plan has been put in force at Cleveland in a local which embraces all north-

eastern Ohio. There is a local at Cincinnati, one at Kansas City and a third at Portland, Ore.

Movements are actively in progress, and some of them nearing completion, for permanent secretaries in Chicago, San Francisco, Detroit and Springfield, Mass. The Council has also assisted in organizing the Border Cities Local Council in the Canadian towns opposite Detroit and in coaching its permanent secretary.

Schools for safety supervisors have been conducted at St. Louis, Pittsburgh, Rochester and Cleveland. In these schools courses of 15 lessons have been given, and 464 men have been graduated. This work has stimulated attendance at foremen's meetings. Taking St. Louis as an illustration, the average attendance for such a meeting in 1918 was about 150. After the opening of the safety supervisor's school the attendance at foremen's meetings ranged from 1200 to 2000.



RALPH C. RICHARDS,
President

Speaking about the decrease in deaths due to public-safety campaigns and the operation of local councils consequent thereon, Mr. Van Schaack said, "In St. Louis the coroner's report for the first eight months of 1919 showed 90 less inquests than in the corresponding months of 1918. Deaths from automobile accidents were 11⅓ per cent. less, notwithstanding a 25 per cent. increase in the number of automobiles in use. In Rochester the accidental deaths during the first six months of 1919 showed a reduction of 18½ per cent. from the figures for the same months of the previous year.

"Incidentally, I am sure you will be interested in knowing that the Council's public-safety propaganda have reached even beyond this continent. Last June, a safety week was conducted at Tokio, Japan, a city of 2,500,000 people, during which not even one fatal accident occurred. The idea of having such a campaign came to the Japanese from news received, through the council, of the safety week in St. Louis last year."

The National Safety Council's work in the matter of national education in safety in schools and colleges also received somewhat lengthy treatment in the address made by the Council's president. A handbook on "The Principles and Practice of Safety" has been prepared by the Council for use in technical schools and universities. Special lectures have been given by members and employees of the Council at several engineering schools, while W. D. Keefer, safety engineer of the Council, has made a successful trip to 18 eastern and mid-western colleges.

Dr. E. George Payne and his associates, said Mr. Van Schaack, have published a book on a plan for introducing safety as part of the curriculum of the common schools, or rather as a pervading element throughout the teaching. The subject is to be introduced as a part of all the branches of study.

The reports of officers and committees followed the president's address, and 25 directors were elected.

In the afternoon a general session was held at which addresses were made on Employees' Representation in Industry, the chairman being Arthur H. Young, manager of the industrial relations of the International Harvester Co. in Chicago.

On Thursday morning there was a general round-table discussion led by Dr. Lucien W. Chaney and L. A. De Blois, and an a.b.c. session in which the fundamentals of safety organization, the duties of the foreman, the promotion of safety education, workmen's inspection committees and the principles of safeguarding were considered and discussed. Concurrently with this twelve sections held meetings, including the mining section.

A large number of representative safety men from the mining industry gathered in the room appointed for the session. Metal-mining men predominated, though the subjects to be discussed held quite as much interest for one class of mining men as another. The preponderance was merely another evidence of the greater advance of the metal industry. That industry has more technical men, is more ardently desirous of learning, more willing to impart information, and is managed on a broader basis than coal mining The coal industry seems to drag along heavily behind its more agile coworker. The piecework system is paralyzing the coal business and throttling its technical development.

## MEETING OF THE MINING SECTION

The meeting was called to order by B. F. Tillson, the chairman, and, after the regular annual reports of the committees had been made, A. H. Fay, the only United States Bureau of Mines man not retained to take part in the conference at Pittsburgh, read an article on "Mine Accidents of English Speaking and Non-English Speaking Employees."

In discussion N. D. Hubbell, of the W. J. Rainey Co., said that the requirement that no one could dig coal till 18 years of age would prevent native Americans from entering the coal mines. It would result in the mines being filled with foreigners. Native boys looking for a place to work and denied entrance to the coal face would enter other employment, and once there would stay there indefinitely.

Martin Flyzik, of the Safety Board, of California, expressed the opinion that no man should be allowed to mine till he had been two years engaged as a helper to an experienced miner. H. G. Davis declared that in 1889 the Gallegher bill was passed requiring of all anthracite miners two years of experience in the anthracite mines of Pennsylvania. After two years of the operation of this law the influx of English-speaking and experienced miners ceased. They did not want to come to America to labor for less experienced men, many of whom were of foreign extraction and did not speak English. Since then the British miner has stayed at home.

The anthracite mine industry can recruit from nowhere, not even from the bituminous mines of the same state. Certificates of competency in any other state or experience in any other field are valueless to the man who desires to enter the services of the anthracite companies as miner. He must start as a laborer, and in all probability only a foreign miner could be found to act as his tutor in a subject which the scholar understands much better than the man at whose feet the law compels him to study.

Mr. Davis believes that three months' experience is enough for qualification, and he would admit any man without question who could show that he was experienced either in the mines here or abroad.

T. D. Lewis declared that the education in the English language at the mines of the Lehigh Coal and Navigation Co. had been quite succesful in extending the use of the English language around the mines of the company and was in consequence doing much to increase the safety of those mines.

Joseph W. Reed, of the Consolidation Coal Co., spoke with approval of the laws of Kentucky. Each company made its own rules, which when they were compiled had to be submitted to the State Mining Inspector for approval. That official often discussed these regulations with the Attorney General to see if they comported with the laws of

the state. After a careful reading and inquiry the State Mining Inspector would approve the regulations or have them amended. As finally approved they were posted by the company and were made to all intents and purposes laws of the commonwealth, enforceable like the regular statutes enacted by the leislature of the state.

Five papers followed, one by W. W. Gidley, safety inspector of the Phelps-Dodge Corporation, Copper Queen Branch, Bisbee, Ariz., entitled "The Management and Training of Men," and one by Charles F. Willis, consulting supervisor of the industrial relations of the Phelps-Dodge Corporation, Bisbee, Ariz., on "Industrial Relations in the Mining Industry." These were followed by E. E. Bach's paper on "Labor Turnover and Its Relation to Mine Accidents" read by B. F. Tillson. Mr. Bach is chief of the Americanization Bureau of the State of Pennsylvania.

C. W. Goodale, in discussing the last-mentioned paper, said that turnover certainly did increase accident, but not altogether in proportion to the degree of turnover. The peaks of turnover and the peaks of accident frequency of the Anaconda Copper Mining Co. occurred on the same ordinates of the time curve but did not seem in any way proportional. He added that 53½ per cent. of the Anaconda Copper Mining Co's employees were from non-English-speaking countries. This doubtless exerts a powerful influence upon the rate and severity of accident occurrence.

SYDNEY J. WILLIAMS,
Secretary

B. F. Tillson remarked that it was always with wonderment that he noted that people were willing to spend large sums of money for safety prevention and yet were little willing to install a complete accounting system for accidents which would show just what was obtained from the expenditure.

It was necessary that we should inquire constantly whether the money we were spending was merely being poured into a hole without result, or yielding returns, in some measure, comparable with the effort. Only by carefully noting the facts relative to the classes of men employed and their accident frequency and the character of the accidents can we understand whether any given expenditures are being productive.

On Thursday afternoon a luncheon was held by the Employees' Publications Section and a general session dealt with Americanization, four more than ordinarily good speakers being on the latter program. They all took the view that Americanization could only travel by the route of friendly assistance, education and goodwill. Men were not to be made Americans by mechanical processes, much less by compulsion.

In the evening a "smile party" with informal dinner was held in the Hotel Winton, the spacious quarters of which were crowded with uproarious guests. The National Safety Council smokers and banquets have always been temperate affairs, no wines, whiskies or beers being served, but they never seemed to be less enjoyable from that fact; and this year, with prohibition in force and ladies present, they were as festive as ever they have been.

On Friday morning the mining section held a long and interesting meeting presided over by B. F. Tillson, the chairman of the section. The first paper presented was on "The Desirability of Standardizing Mine-Rescue Training and a Plan for Standardization," by D. J. Parker, Mine Safety Engineer of the United States Bureau of Mines Experiment Station, Pittsburgh, Penn. In the absence of the author the article was introduced by Dr. A. F. Knoefel, of Terre Haute, Ind., Mr. Parker being detained in Pittsburgh by the Annual Conference of the Bureau of Mines, which was planned to follow the dedication ceremonies.

In the discussion of the matters presented N. D. Hubbell, of the W. J. Rainey Co., Uniontown, Penn., declared that his company has installed the Gibbs apparatus, because in that type the rubber parts were all carried on the back of the apparatus man, and are protected by an adequate cover instead of being on the front where the air is apt to be cut off when crawling through a low place.

G. B. Southworth, of the West Virginia Coal and Coke Co., Elkins, W. Va., urged that mine-rescue certificates be renewed every six months. Any man whose information about rescue work was allowed to grow hazy was apt to be an inefficient and unsafe rescue man. J. L. Boardman, of the Anaconda Copper Mining Co., Butte, Mont., stated that in his opinion all points were against the constant-feed machines and in favor of those which regulated the oxygen flow to suit the needs of the apparatus wearer.

### EFFECTS OF BREATHING NITROGEN

He related the death of a man who was wearing a half-hour Draeger. The man went about 200 ft. and worked for about 5 minutes. He then returned and fell down suddenly before he managed to reach respirable air. His nose clip was in place, but it was found that his oxygen was not turned on and there was no air in the bag. The speaker declared that the regenerator had removed the carbon dioxide from the breathing bag until, it not being replenished by oxygen, became so entirely depleted that it contained nothing but nitrogen. Carbon dioxide irritates the respiratory nerves and causes rapid breathing, but here there was no irritation, and the victim failed to become aware of the fact that everything was not normal with the result that he suddenly dropped dead.

Mr. Boardman urged the importance of the doctor's examination of all applicants for mine-rescue certificates. He said that out of 300 would-be mine-rescue men at the plant of the Anaconda Copper Mining Co. only about 60 men were found physically fit for exposure to the great strain involved.

Mr. Boardman said that the weight of the men chosen should range between 130 and 180 lbs. though in some cases heavier men than the upper limit were doing rescue work. He also said that the Anaconda Copper Mining Co. examined its mine-rescue men every six months. He approved of a standardization of methods and training of the general character of that proposed, though he had not read or heard the reading of the paper.

At one disaster, of 30 men presenting themselves at the gate for mine-rescue work, many Bureau of Mines certificated men who had early received training in apparatus work were found, when they presented themselves, to have had but one day's instruction, the length of time of all the men running from one to six days. It was soon found that some of the 30 could not stand the work. The Bureau of Mines has for some time given its certificates only to those who have had six days' training.

The question being asked whether bonuses were paid to mine-rescue men, Mr. Boardman replied that the time expended in mine-rescue training was paid for by the company, and mine-rescue men worked at their regular work from 9 a.m. till 4 p.m. instead of from 8 a.m. till 4 p.m. However, from 4 to 5 p.m. the men go through the mine acting as "firebugs," seeing that no fires are left after the day's work. These men are now paid 75c. a day extra for their services, the rate having been recently advanced from 50c. a day. About 300 men are now drawing the bonus.

and about 300 others are awaiting positions on the mine-rescue staff.

When asked how many sets were a minimum for any company, he said that there should not be less than four sets because when four men go out with apparatus, one of the four is likely to be overcome and it will take at least three others to bring him out. Mr. Seip commented on this remark by saying that no isolated station should have less than two complete outfits, each of which should contain four, or preferably five, sets of breathing apparatus, and Mr. Boardman agreed that his statement that four sets constituted a minimum was valid only where, as at Butte, there were a number of other mines nearby that could supply appartus when called upon.

Mr. Boardman urged that in places of low humidity all rubber parts should be scalded in hot water once a week. Mr. Riggs, a member from Nevada, said that he had under his care 64 sets of apparatus and had constructed a dugout in which to keep his rubber parts. His hope was that the humidity of this cave would tend to keep the rubber in good condition. Every two weeks he put his rubber parts in lukewarm, not scalding, water.

Another member declared that he had installed an air-tight locker which he hoped to maintain at a constant humidity. In this way he expected to keep the rubber parts of his apparatus in perfect condition. H. G. Davis, of the Lehigh-Wilkes-Barre Coal Co., said that he had found steam heat was extremely detrimental to the rubber parts of rescue apparatus. For this reason he had taken out the steam pipes in the mine-rescue station and replaced them by stoves.

Joseph W. Reed, safety engineer, of the Consolidation Coal Co., questioned whether the deterioration was wholly chargeable to the lack of care on the part of the company maintaing rescue apparatus. It was quite likely that apparatus was six months old when purchased and so had suffered already a large degree of deterioration.

### RUBBER PARTS SHOULD BE RENEWED SEMI-ANNUALLY

It would be well, he said, if the companies selling such apparatus would put a date on its rubber parts and so fix beyond question the time of manufacture. He stated that while rubber parts might have a life of two years, it was best to renew them every 12 to 15 months and place a steady order with the manufacturer so that about every six months parts of some of the apparatus on hand would be renewed.

F. F. Morris, of the Atmos Corporation, said that distributors in past years had to depend on the exigencies of transportation. The distributors kept their stocks down to the lowest level possible, but it was necessary sometimes to keep some apparatus for six months. It was always impossible to tell how long the apparatus had lain abroad. Today it is different. Apparatus can be purchased entirely of American construction. Mr. Morris considered that the stamping of apparatus with the date of its manufacture was an excellent suggestion which he purposed to follow.

When those present tended to put all the blame for accidents in rescue work on the condition of the apparatus, Dr. A. F. Knoefel declared that the condition of the rescue man was about equally important and should be carefully stressed. The myocardium or outer muscular substance of the heart is unlike other muscles. It works all the time, night and day, thus bringing excessive strain upon it.

Mr. Boardman declared that physicians too often made a cursory examination of would-be rescue men, certifying "O.K." to every detail without any test. One man whose record he had questioned, he was obliged to permit to go on with the training, fearing that otherwise he would have a strike. Neither he nor the foreman thought this applicant a fit man for rescue work, but he had nevertheless qualified physically and had to be allowed to continue the instruction.

A few days later the rescuemen who had been taking training with him declared they would go no further with it so long as he was retained, as he was known to have a disease that they had good reason to believe might be communicated through the common use of the breathing apparatus. This development simplified matters, and the man's services were dispensed with.

The second paper on "Effective Use of Rescue Apparatus in the Fighting of Mine Fires," by J. T. Ryan, of the Mine Safety Appliances Co., was read in his absence by Mr. Riggs. In the discussion that followed J. C. Roberts, of the Colorado School of Mines, Golden, Colo., described the mine recovery at Black Hawk colliery, Black Hawk, Utah, where a fire originated, apparently from the throwing of a cigarette stump onto the fringe of the canvas which was hung from the lower edge of a mine door.

### USE OF THE GEOPHONE IN FIRE LOCATION

Mr. Roberts said that smoking should be forbidden in all mines, gaseous and nongaseous alike. He regretted that nothing had been said about the geophone as a means of locating mine fires. This instrument, he said, could be used for such location even if the ignited coal were covered by 250 to 300 ft. of cover. As it was impossible to close off the Black Hawk mine workings and so smother out the fire in its own incombustible gases, it was necessary to load out the incandescent coke, which stood in places in masses 17 ft. deep and 20 ft. wide. The walls of the entry have fallen in as a result of the heat.

The suggestion was offered that an attempt should be made to establish the size of openings through which it was safe to attempt rescue work. F. F. Morris quoted J. W. Paul, saying that no man should pass in mine-rescue apparatus through any hole which is so small that he could not return helping another man.

Mr. Woodburn desired to know the higher limit of temperature at which work in rescue apparatus could be performed. His teams had put in a stopping where the temperature was 116 deg. Fahr. Mr. Riggs said his men had worked in a temperature of 140 deg. Mr. Boardman remarked that where the ventilation was good and the air dry the rapid evaporation from the surface of the skin promoted the elimination of water through the epidermis. With this water he believed much carbon dioxide was also eliminated.

Mr. Woodburn then introduced the question whether mine-rescue squads should carry a stretcher. He believed that they had enough to carry without burdening themselves in that way. He instructed his men always to pick up a car, preferably a timber car, and push it forward to the nearest fall of rock. Leaving the car at that point and pushing on over the fall, they would keep their eyes open for another car, which found, they would push forward to the next fall. In that way in case of an accident it would be possible to find cars handy all along the track and save the labor of carrying the man, who might be overcome, a long distance on the stretcher.

Mr. Boardman believed that it was a small matter to carry a Windflex stretcher which only weighed 3½ lb. His squads carried an extra 2-hour apparatus.

On request he related the way he had used a bomb to blow off a globe valve at the end of a buried air line by which it was purposed to carry water to a fire at the top of a cave. The compressed air was used to lift the bomb into place. Apparently the bomb kept ahead of the compressed air. Had much air passed it, it would not, as Mr. Tillson well observed, have been driven to the end of the line. The globe valve was blown off, and a water line con-

nected with the pipe with the result that the fire was soon extinguished.

When the question arose as to the longest trip in rescue apparatus on record, there was a general protest against emphasizing any such record for it would give the public too great a confidence in the possibilities of apparatus and make people too much disposed to demand what rescue men could not supply.

The best record perhaps was attained at the Speculator disaster, which was declared, not too confidently, to be 2 miles of travel each way, or 4 miles in all. The men expected to come out another way but found an inflow of water blocked the road and so had to return. Little oxygen was left when they reached the fresh-air base, and they had been two hours on the way.

Mr. Morris said that it was not well to make much of such hazardous trips that could not be regarded as having the proper factor of safety. He said it was usual in exploration to go as far as could be reached in 20 min. and then return to the fresh-air base.

Robert H. Seip, mining engineer, New Jersey Zinc Co., Franklin, N. J., urged that as one man of the party was likely to fall at any time, the others should be ready to carry him out, and 1500 ft. was far enough for any such difficult and laborious operation.

Mr. Woodburn declared that it was commonly said that it was safe to travel 2000 ft. on the level, 200 ft. on raises and 150 ft. up stopes, but he would not permit his rescue men to go up raises without his permission. As was emphasized, how far a team should go depends on the condition of the roadway and its grade. No general rule can be given. Moreover, the work to be accomplished en route is an important consideration.

### USE OF PYRENE IN FIGHTING FIRE

Mr. Woodburn stated that he had used pyrene for fighting fire with apparent success. He was not able to observe directly the work of the gas, but after the fire was over he found the timber charred halfway through. He felt sure that the pyrene had done the work of extinguishing the fire, though the fire must have been burning quite briskly to judge by the effect on the timber.

Mr. Boardman also testified to the value of pyrene from his experience in Kansas. However, judging by its effect on a mule that was exposed to the fumes, he thought pyrene if carelessly handled might affect or injure the fire-fighting crew.

Mr. Woodburn emphasized the importance of examining all working places after the shift goes off. The session ended with a few most interesting and all too short remarks from someone who had so far had nothing to say—Angus McLeod, fire chief of the Butte and Superior Co., Butte, Mont. That company had worked its way into the disaster class mainly occupied hitherto by coal mines, by a fire in which many lives were lost. It was felt that many could have been saved had there been rescue chambers in the mine. These were now being constructed, the intention being to make them gas proof.

Furthermore, arrangements were made to feed valeric acid into the compressed air lines in case a warning to the men below was necessary. The valeric acid would in a few minutes be spread through the compressed-air pipes throughout the mine and would clearly indicate the presence of danger and suggest a retreat to the "bulkheads." Another arrangement provided was a good signaling system.

Professor Sperr wanted to know the experience as to the penetration of ribs by noxious gases. He believed something more than bulkheading was needed in many mines where the natural walls were of such a character that not only gases but water would penetrate them.

Mr. McLeod said that his bulkheads resisted gas satisfactorily, but others said that in their mines it would be necessary to line the walls and floor for 100 ft. or thereabouts with gunite.

Following this discussion the chairman read an article by M. W. Price, efficiency engineer of the G. B. Markle Co., Jeddo, Penn. entitled "Fire Prevention in Anthracite Coal Mines and Necessary Equipment for Fighting Mine Fires."

H. G. Davis said that mine fires were of almost daily occurrence before permissible explosives were introduced. He said that pouring water from a big tank onto a fire had in one case that he recalled merely extended the fire area. He was not much in favor of such a fire-fighting method.

### MUCH PEP AT THE BANQUET

The banquet on Friday evening was a pleasing event with speeches and songs interspersed. Sometimes the guests sung and at others a staff of vaudeville singers; however some of the numbers were of less popular order. There were renditions of old songs of the forties and Maria Condé, now Mrs. David S. Bayer, a former Metropolitan Opera House diva, recited "Safety Last" and sang the "Bird Song" in French.

The chairman was Stephen W. Tener, president of the Northeastern Ohio Division of the National Safety Council and the toastmaster, Alexander C. Brown, the vice-president of the same organization and president of the Brown Hoisting Machine Co.

James Speyer, the banker, who is treasurer of the Safety Institute of America, was the principal speaker. His address largely emphasized the steady movement toward new methods of social achievement.

He showed how we had accepted much of the platform of the Populists of 1891, unpopular as that program then was while some of the economic projects urged in that program have been rejected and are regarded with less favor now than even they were then. To show the flux of public sentiment he pointed to the advance of prohibition and woman suffrage which many years ago had few and insignificant adherents and now are accomplished facts. He urged that we must not oppose change as change, but see that it came in a quiet, orderly and constructive manner, ever proving its rights to its place in the scheme of things before it came definitely into being.

The speechmaking closed with an address by the new president R. C. Richards, one of the original founders of the National Safety Council.

On Saturday morning, at the meeting of the mining section, B. F. Tillson read for C. A. Mitke, a consulting mining engineer, for the Phelps-Dodge Corporation among others, a paper entitled "A Compilation of Chute Types for Loading Ore into Tram cars in Metal Mines." Why the subject matter was limited to metal mines is hard to determine, for the subject of chutes is quite broad and has relevancy to the anthracite regions, to the Georges Creek field and some of the Western coal mines both in the United States and Canada.

In discussing the paper Mr. Trestrail stated that he did not consider it was well to put breaks in chutes because when the chutes are allowed to fill these breaks hold the material in place so that when the chute is opened the material will not flow. Prof. Speer said that all ore would run at some angle, somewhere between 60 and 70 degrees, the latter pitch rarely being necessary. He felt that breaks so constructed as to exceed slightly the angle of flow would not interfere unduly with the flow of material whereas with vertical chutes there was a tendency of the material to pack and wedge into place. He opposed using a long chute in a shrinkage stope, for there was an assurance that

the chute would wear out before it ceased to be needed. When so worn it could not be repaired.

Mr. Boardman questioned whether the size of the material did not have a great deal to do with its packing. When the grizzely has large openings it is more than usually apt to clog the chute. He thought it would be a profitable study that would determine the proper size of grizzely for any given size of chute.

Mr. Tillson said that the New Jersey Zinc Co. standardized on a 12 x 15 in. opening. All small raises were widened so as to give an 8 x 8 ft. opening and with such an opening good results were obtained. The flattest raises were about 50 deg. in pitch. The flatter the pitch of the raise the better so long as the material will run. Too steep a slope is objectionable because the chunks will pack and arch across the opening and will then need dislodging.

When someone suggested that, when the material had packed in a chute, the loader should put in a shot and bring the material down, Mr. Gidley stated that the Phelps-Dodge Corporation would not permit a loader to shoot such a hang in a chute but would provide a miner to do such work.

## DISPOSITION OF TROLLEY WIRE

Much was said as to the disposal of trolley wires around chutes, one of the engineers expressing his preference for the use of a side and bottom guard under and at the side of the wire respectively and a swiveled and ball-jointed trolley pole that would permit the trolley wheel to run above the bottom board or guard. The wire with this arrangement was kept well out of danger, and an accident could hardly take place without malicious intention on the part of the loader.

By this ingenius arrangement the trolley pole with its right angled attachment reaches up over the bottom board and engages the trolley wire. To most men however the use of a storage-battery locomotive now or eventually seems indicated, and this was suggested by one of those present. Of course these roads are often narrow, and storage-battery locomotives may therefore frequently not be suitable, but nevertheless there are many cases where a combination storage-battery and trolley locomotive should work out admirably. And here it may be remarked that the metal-mine industry is in the matter of haulage hardly as progressive as the coal industry.

As regards chutes no one present seemed to feel that Mr. Mitke had said the last word. A gate should first shut off the flow at the bottom plate of the chute and should not choke the flow at the top till later. In fine, it should lift the lumps upward not crush them downward. To bring the door down on the ore is likely to land the edge of the door on a large resistant lump and let the fines all go through.

The Oliver Iron Mining Co. makes a large room at the side of the chute above the level of the drift. This room is approachable by a ladder way. If the chute blocks, the obstruction can be loosened by a man with a bar, the man operating the bar from this room at the side of the chute. The company argues that to loosen the choked material through the chute door with the man stationed at a point in the roadway below is extremely dangerous.

The room at the side makes the work of loading much safer and might be adopted in coal mines with heavy pitches if the room could be constructed without unduly destroying the integrity of the pillars which often are unequal to resisting even the burden now laid on them.

Major Arthur S. Dwight, chairman of the Industrial Organization Committee, American Institute of Mining Engineers, read an article on "The Importance of Safety Measures to the Miner" which was followed by an interesting discussion as to the relative fatality frequency in large and small mines.

Martin Flyzik took issue with Mr. Dwight as to that frequency, declaring that in the state of Washington the hazard was the greater in the large mines as based on the record of all accidents including those which involved only 7 days of abstention from work. He also said that this could not be explained by the alleged fact that the larger mines worked the more steadily, for, at least in Washington, the reverse condition obtained. The small mines were the more regular in operation.

A. S. Fay took the opposite stand, basing his figures on the whole of the United States. J. W. Reed, at one time a mine inspector, said that there were two types of relatively safe mines, the small mine which the owner frequently visits and which can therefore be kept by him in reasonably safe condition and the large mine where the work of safety has been made such a matter of specialized concern that persons are employed to see that the safety of the mine is not neglected.

The unsafe mine is usually the medium-sized mine, too large for the perpetual supervision of the owner and too small for the oversight of specialized safety men.

## ADDRESS BY THE CHAIRMAN

B. F. Tillson's address entitled "Need for a Definite Technical Service in the Mining Section of the National Safety Council" was listened to with much interest. Everyone seemed to believe that his company would be willing to pay double dues in return for better services but they doubted whether nonmembers would be disposed to take out membership at the increased figure.

Mr. Bowman, whose friends and associates were contemplating a plan for turning a local safety oranization at Butte, into a full-fledged section of the National Safety Council suggested that it would be necessary to make a similar levy for the local council. Thus the dues would be tripled and not doubled.

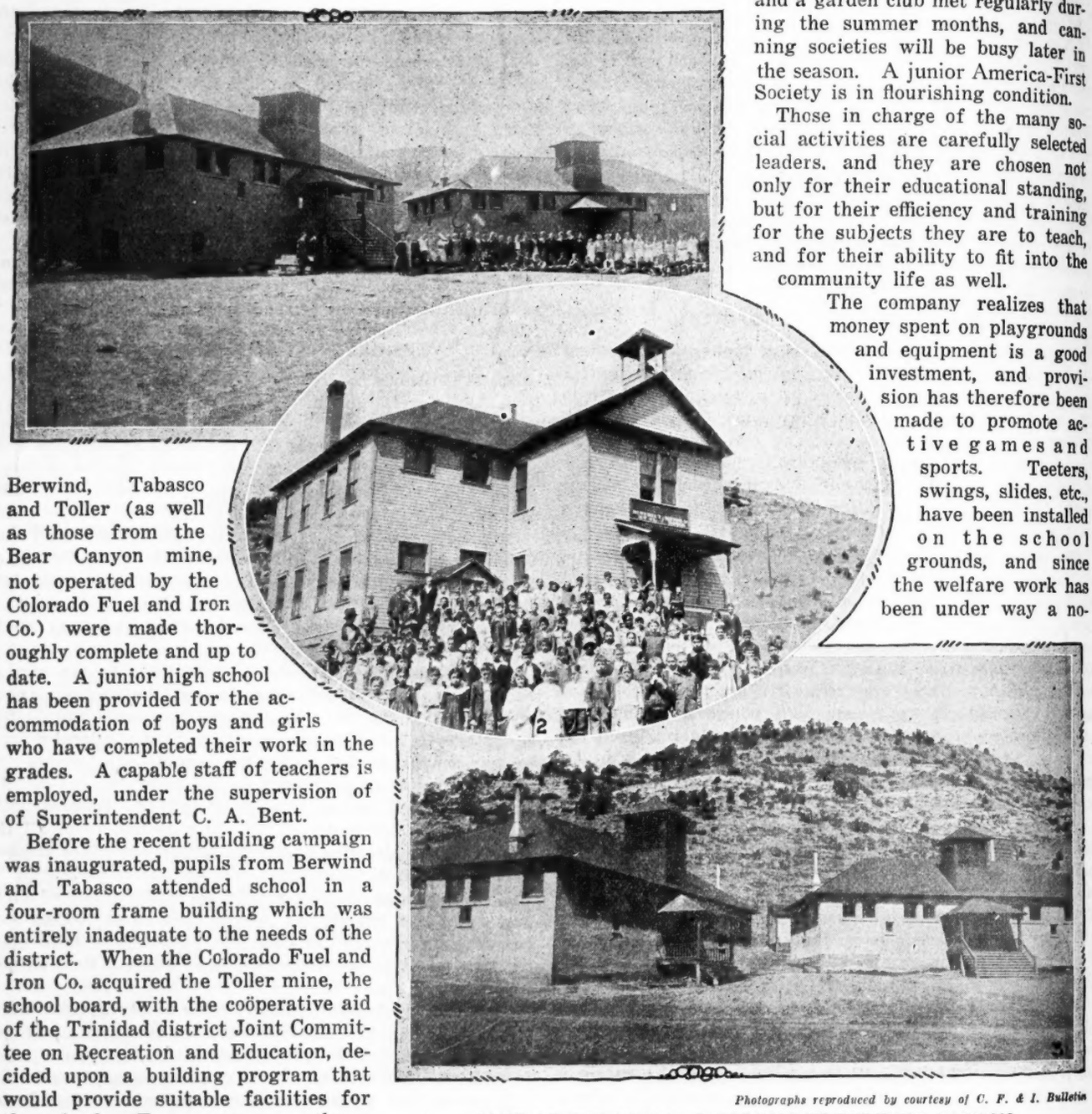
He thought the locals should contribute to the section as well as to the National Safety Council, but the suggestion met with no approval (1) because the locals should not contribute to a section as the members of the local do not by any means all belong to the section (2) because the sections should be supported by all members and not by those only that belong to a local and (3) because nothing but the dues indicated as being desired from all the members in the section would be enough to finance the section and enable it to employ a technical secretary.

It was decided to take a vote as to the views of those present and to submit the matter by mail to the member companies for their decision, the balloting to take place and the result to be announced in as short a time as possible.

There was to be a discussion of the Safety Practice Pamphlet on "Mine Car Haulage" but no time remained and the matter was left to correspondence and the good judgement of R. H. Guerrant, who had done so much to formulate what has already appeared in mimeograph form. Other booklets are suggested on Mine Chutes and the Use of Explosives in Mines. The nominating committee, consisting of R. Dawson Hall, Charles W. Goodale and J. C. Roberts, reported in favor of the following officers for the ensuing year: B. F. Tillson, of Franklin Furnace, N. J. chairman; H. G. Davis, of Wilkes-Barre, Penn., first vice chairman; Dr. A. F. Knoefel, of Terre Haute, Ind., second vice-chairman; C. A. Mitke, of Bisbee, Ariz., third vice-chairman; and W. H. Shearman, of New York City, secretary. The chairman will appoint the chairmen of the various committees. After this election the sectional meeting was declared adjourned.

# Berwind Canyon Is School Center

A public school system, probably as complete and modern as can be boasted by any rural community in the State of Colorado, has been built up in Berwind Canyon by the Colorado Fuel and Iron Co. With the completion in 1918 of several new buildings, the schools attended by the children of coal miners working at Berwind, Tabasco and Toller (as well as those from the Bear Canyon mine, not operated by the Colorado Fuel and Iron Co.) were made thoroughly complete and up to date. A junior high school has been provided for the accommodation of boys and girls who have completed their work in the grades. A capable staff of teachers is employed, under the supervision of of Superintendent C. A. Bent.



*Photographs reproduced by courtesy of C. F. & I. Bulletin*

SOME OF THE SCHOOL BUILDINGS IN BERWIND CANYON

1—The new high school buildings. 2—Corwin School. 3—New buildings near the Toller Mine

Before the recent building campaign was inaugurated, pupils from Berwind and Tabasco attended school in a four-room frame building which was entirely inadequate to the needs of the district. When the Colorado Fuel and Iron Co. acquired the Toller mine, the school board, with the coöperative aid of the Trinidad district Joint Committee on Recreation and Education, decided upon a building program that would provide suitable facilities for the schoo's. Two rooms were thereupon added to the old school at Berwind, and two small buildings were erected at Toller and one adjacent to the Bear Canyon Camp. These buildings accommodate the pupils up to and including the fifth grade. Between Berwind-Tabasco and Toller, as nearly as possible in the center of the district, two two-room buildings were erected for the use of the junior high school, attended by pupils from the sixth to the ninth grades inclusive. This fall tenth-grade work will be added, and, if conditions justify it, eventually a full four-year high school course.

Considerable attention has been devoted by the Colorado Fuel and Iron Co., to the question of education in its mining communities; and as a natural outcome of the study its officials have given to the subject there has come about the organization of boys' and girls' clubs, and the promotion of other activities under the direction of Superintendent Bent. A poultry and pet stock club and a garden club met regularly during the summer months, and canning societies will be busy later in the season. A junior America-First Society is in flourishing condition.

Those in charge of the many social activities are carefully selected leaders, and they are chosen not only for their educational standing, but for their efficiency and training for the subjects they are to teach, and for their ability to fit into the community life as well.

The company realizes that money spent on playgrounds and equipment is a good investment, and provision has therefore been made to promote active games and sports. Teeters, swings, slides, etc., have been installed on the school grounds, and since the welfare work has been under way a noticeable change for the better has been wrought in the conduct of the children both at school and in the camp.

The wage earners of the Colorado Fuel and Iron Co. have been under the Industrial Representation Plan for about four years, and the extension of the principle of employee's representation to salaried men and women, including foremen and office workers, was provided for recently. During the time the principle has been in effect it has been fully tested.

# DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

## Bolshevism in America

*Letter No. 5*—Speaking of Bolshevism, it must be admitted that its chief menace to our country is through the alluring propaganda that particularly appeals to the impressionable foreigner and to certain elements of our own people. In the light of developments, it appears that the more intolerable the social system of a nation or country has been by reason of the war, the more unsettled is its present economic problems. In such countries, Bolshevism has been able to exert a more tenacious influence, and its helpless and impoverished people have been insnared as by the tentacles of some great sea monster.

Russia is a sorry example of this condition and has proved a fertile field for the exploitation of the Bolshevik element that forms so large a proportion of its population. From the condition of an oppressed and downtrodden pepole, Russia has now passed into the hands of a torn, chaotic and disordered government. Other nations whose subjects fared better, under a more balanced, economic system of government, have not fallen victims, to the same degree, to this reign of terror.

While the condition in America is serious enough to awaken our people to the need of combating the spread of Bolshevism among us, the menace has not assumed proportions sufficient to terrorize anyone. American labor, backed by the A. F. of L., has taken a firm stand against the spread of such propaganda. But American labor, by its impatient demand for excessively high wages, shorter days, and by incessant strikes and lockouts has unwittingly opened a very promising field to the exploitation of Bolshevism.

Far better would it be for the workers in all our industries to wait patiently for the Government to apply its promised remedy for the high cost of living. Government activities along this line will prove more effectual than strikes and lockouts, which only unsettle business and furnish the opportunity desired by preachers of anarchy to further their ends.

As rapidly as possible, the A. F. of L. is weeding out from its membership the undesirable element that breathes discontent among workers. At the present time we cannot improve our economic system by a six- or seven-hour day, or by demanding increased wages. The first, by reducing production, and the second by increasing its cost, would boost the price of commodities and augment the cost of living. Strikes and lockouts have the same effect.

None of these means will prove effectual, and all are unwise. It must be remembered that the producer is hampered, like as we are, by reason of the high price he is forced to pay for crude material and must protect himself from this nightmare of high prices. In the end the worker finds that the cost of necessities has kept pace with his shorter hours and increased wage

The Government has started a war on profiteers that, it is safe to say, will bring relief if we are patient enough to wait a reasonable length of time, pending the necessary investigation and application of the promised remedy. Regarding the situation calmly, it is evident that progress is being made. The organized and systematic efforts of the Government cannot fail to produce results, in bringing the price of necessities and the cost of public utilities back to a normal pre-war basis.

We must rely on the integrity of the Government that has proclaimed its intention of throwing all its resources and energies into the effort to run down the profiteer, who will soon be an unpleasant memory of the unhappy and disastrous war. Our duty is clear; namely, to wait till the Government acts. Anything else can only aggravate a bad condition and make America a more fertile field for Bolshevik activities.

Thomas, W. Va. MINE WORKER.

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*Letter No. 6*—That Bolshevism has, to some extent, already gained a foothold here in America is, to say the least, without a doubt. In my opinion, it will prove a very serious and troublesome question to handle, and one that should receive the careful attention of every thoughtful and patriotic citizen throughout our entire country. The pernicious propaganda has already gained a stronghold in some places and will grow rapidly and spread to other places if not checked by some effective means.

The time is not far distant when Bolshevism, in this country, will assert itself in its worst form if it is left alone. If unhindred the doctrine will soon become rooted in the minds of large numbers of our workmen, especially the foreign-born. All one has to do is to read the daily press to be convinced that Bolshevism is growing and becoming more bold and defiant in this country. The evil doctrine it promulgates is spreading and, in my opinion, will remain with us longer than will be good for the country. It is found in many places where least expected and, by reason of this fact, it is the more dangerous and harder to check.

### BOLSHEVIC VIEWS ARE CHANGEABLE

As indicated by the striking analogy of the dog and the bone, in the Foreword, in the issue of *Coal Age*, July 3, when the wealth of others, which the Bolshevist is trying to destroy, falls into his own hands, he turns right-about-face; his views in regard to the possession of wealth change quickly and his brother Bolshevist sets upon him, denounces him and endeavors to despoil him of his goods.

Actuated by hatred and selfish motives, the Bolshevist would destroy the property of all who have been economical and thrifty, and have thereby accumulated enough to own their homes and are educating their children and

taking an interest in the betterment of the community in which they live.

"Justice," in his letter, *Coal Age*, July 3, p. 31, says, "We must see that no person has any cause for legitimate grievance under our flag." The greatest trouble with the Bolshevik workman is, however, his grievances are most generally imaginary, born and fostered in his own evil and selfish mind, and are far more difficult to adjust and satisfy than if they were real. While he is being apparently satisfied at one point, he is getting out of joint at another. It is a large part of his business to see to it that things are not to his liking, all along the line and at the same time. His nature is to find fault with everything progressive, and not be satisfied with anything. He hates and envies everyone who by steady work and frugal living is more thrifty than himself. He would take the wealth accumulated by others, but makes no effort to gain it by industrious means for himself.

I agree with the view expressed by Richard Bowen in his letter, Aug. 21, p. 333, namely, that by coöperation and association with their employees, operators can do much toward preventing the spread of the doctrine of Bolshevism in America. The enactment of stringent laws, unless rigidly enforced, will have but little effect in checking its spread. In my opinion, more can be done in this respect by education, earnest coöperation, friendly association and kind treatment. By making the living conditions of employees better, in and around the mines, far more will be accomplished than by the enactment of too many laws.

It does not cost anything for the mine official to be polite and friendly to employees, at all times. This can be done even in the giving of orders. The successful official knows his men by name and greets them kindly and pleasantly wherever he meets them. By this means he gains their friendship and loyalty to an extent that can be gained in no other way. Some one has said, "The best and surest way to kill an enemy is to make him a friend."

From the standpoint of the Bolshevik element of labor, in the operation of coal mines, the bad and unfair treatment is all on the part of the operator or mine official. He alone is inhuman, selfish and unreasonable, and the one who makes all the mistakes. Experience has convinced the intelligent worker that this is not always true. It cannot be charged that the employer is always in the wrong and the employee always in the right when there is a difference of opinion in regard to treatment or wages. This would be the case, were we to listen quietly to certain elements of labor.

It is unfortunate that, for their own selfish purposes, many politicians and others manifest such a readiness to take the side of discontented workmen in their controversies with their employer, at the present time, without investigating the matter to find who is in the right and who in the wrong. The exhibition of such sympathy and encouragement has a strong tendency to assist the growth of anarchy among certain classes of laboring men. There is a class of workmen who are never satisfied and contented, even when they are doing well. They are continually looking for something with which to find fault. Such only need the encouragement they get from this selfish political element to develop into dangerous Bolshevists.

High wages and the scarcity of labor during the war seem to have unbalanced the minds of many workmen in regard to what ought to be considered reasonable wages and fair treatment. Many of them received three times as much as they were worth or earned, and, as a result, they have become unreasonable. For companies to grant every demand for a raise of wages, and to shorten the hours constituting a working day, would have no effect to check the growth and spread of Bolshevism. With the extremely radical and irresponsible element now in control, in many labor unions, the granting of these demands on the part of companies would have the effect only to increase discontent among many employees.

The best men, in all labor unions, should see to it that the men who are put at the head of their organizations are not tainted with anarchy and are men of broad and liberal views, whose judgment of the differences that arise between labor and capital is only formed after a thorough investigation of the points involved in the controversy. It is the patriotic duty of all good citizens who have a sound regard for the best interest of the country, to use their influence wherever possible to check and eradicate every noxious taint of Bolshevism as soon as it is discovered.

In conclusion, let me say that, in my opinion, the enforced government control of the railroads, in the country, during the past nearly two years, by reason of the conditions imposed by the war, has developed a disposition among railroad employees that leads them to make unreasonable demands. This would seem to be the starting point of our labor troubles and makes the country ripe for Bolshevism. JOHN ROSE.

Dayton, Tenn.

## Finding a Mine Door Set Open

*Letter No. 1*—In discussing the interesting point raised by Richard Bowen, in his inquiry, *Coal Age*, Sept. 11, p. 462, regarding the matter of starting the examination of a mine at the intake end of the section and following the air current, or beginning at the return end and proceeding against the air, it seems to me that we cannot do better than to assume the situation and conditions described and illustrated in the plan he has presented and shown below.

It is my desire to consider this question wholly from a practical standpoint, guided by an experience of a number of years as fireboss, safety and mine inspector, mine foreman and superintendent, in different fields. Some of the mines in my charge have been what would be classed as gassy mines, two of these having formerly suffered serious explosions of gas resulting in loss of lives.

Like Mr. Bowen, I would not close a door that was found standing open and not knowing the conditions existing in that section or how long the door had been open. Instead, I would leave the door as it was found and proceed to examine the section and ascertain its condition before returning and closing the door. But, further than this, my plan of examining a mine differs from that outlined by our friend.

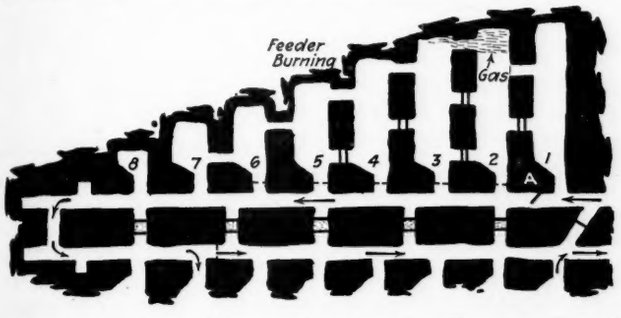
When making an examination of a mine, my experience as fireboss would never permit me to start at the return end of the section. To my mind, the dangers of such a plan are too apparent to take any chances by exposing one's self to the return air of a section when

the condition of that section is unknown and may prove highly dangerous from the presence of poisonous gas that is not indicated on the safety lamp.

It is not to be supposed that Mr. Bowen would carry mice or birds with him when making the examination, and there is every chance that he might easily walk into a poisonous atmosphere without warning of its presence. I recall an instance where a fireboss ran into a place filled with poisonous gas that gave no indication on his lamp and was only rescued by the foreman, who tied a wet handkerchief over his own mouth and ran in and dragged the man out to fresh air.

Another instance of a similar escape, but not in a mine, is that of a young dentist of Winnipeg, a member of the Canadian volunteers, who when caught in German gas, as he was carrying an important message, dipped his Glengarry cap in water and, holding it in his teeth, continued his race with death and delivered his message, after which he was confined in a hospital for several months before he recovered.

Referring now to the figure, let us suppose that we start the examination of this section by entering Chamber No. 1 and find no air passing. Returning at once to the entry and finding the door open, I would let it




remain in that position and return to Chamber 1 and proceed to examine that place up to the face, using every possible precaution in so doing. Then, passing through the crosscut and finding gas accumulated at the face of Chamber 2, I would return through that chamber to the entry and proceed to examine Chamber 3 to ascertain how much gas may have accumulated there.

Returning now to the entry, I would throw back the canvas or curtain hanging in the mouth of Chamber 3 and close the door on the entry between Chambers 1 and 2, which would restore the circulation in these three chambers and drain the gas from the face of Chamber 2, carrying it out directly into the entry in the shortest possible time.

This done, I would continue my examination following the direction in which the miner travels under normal conditions. On reaching Chamber 5 and finding a gas feeder burning at the face, I would try to put it out; but failing in this, I would close the crosscut leading to Chamber 4 with a temporary stopping so as to cut off the air and then fence off the mouth of this chamber and of each of the remaining chambers inby on the entry.

In dealing with the burning feeder, only experienced would be allowed in the fenced portion. Before proceeding with that work, however, I would again examine Chambers 2 and 3 and if these are found to be clear of gas I would open the canvas or curtain in the neck of Chamber 4 and close that in the mouth of Chamber 3.

In my judgment, the only safe and proper way for a fireboss to examine any mine, whether generating gas or not, is to begin at the intake end and proceed with the air. He is then in a position to detect at once whatever may be wrong in the circulation, by reason of the short-circuiting of the current or other possible cause.

ANDREW O. BAIN.

McKeesport, Penn.

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*Letter No. 2*—Referring to the inquiry of Richard Bowen, *Coal Age*, Sept. 11, p. 462, asking for a general discussion on two important features involved in the answer given, in a certain textbook, to a question regarding the proper and safe method to pursue in examining a mine, after finding a door set open, when starting to make the regular inspection of the mine: (1) Whether to proceed with the intake air after the usual manner or custom in making the regular examinations, or (2) to begin at the return and proceed against the air.

Regarding the first point, it has been my custom when acting as a fireboss, if I found a door standing open on the gangway and short-circuiting the air current, I would first examine the places where gas might be expected to accumulate, before shutting the door. Then I would make a second examination if it was found necessary to remove a standing body of gas.

## OPEN DOORS ARE UNPLEASANT

It is not a very cheering prospect to find a door open in the morning, which you are quite certain has been open several hours, as it is not safe to close it immediately and begin your inspection. Neither is it pleasant to make an examination of the section in which you know no air has been passing for several hours; because you fear that you may enter a standing body of gas unexpectedly, unless you proceed with more than usual caution and care. Therefore, the safest and most logical plan to follow, in the event of finding a door open, is to leave it open until you have examined the places in that section, unless you can be absolutely certain that there are no burning feeders, lights or fires, on the return; but how would a fireboss know this to a certainty?

However, unlike Mr. Bowen, even where the geological formation and local conditions have favored starting the examination at the return end, I have always followed the intake, instead of traveling against the air. In other words, I have "Followed the Formula," as I believe seventy per cent. of the firebosses of the country are doing, in following the intake, to which custom Mr. Bowen seems inclined to take exception.

In my opinion, there are no special advantages to be had in starting the examination of a mine at the return end of the airway; and there are some disadvantages in such a plan if the mine liberates much gas, unless the inspection is made with extreme caution and there is no possibility of the air being short-circuited.

In traveling against the air, in a mine generating gas freely, it must be remembered that the return air contains a certain percentage of gas which your lamp and close observation will not detect. This may happen when there is present, say two per cent. If you should detect as much as two per cent. of gas in the return airway, you conclude that a very unusual and dangerous condition existed ahead of you. You could not tell where, but you would know that it was up to you to grope your way very carefully till you had found the trouble.

A fireboss is ever confronted with the danger of unexpectedly walking into a large body of standing gas and igniting it. Brattices may be found down, in passing from one working place to another through a breakthrough, where a feeder would be responsible for a dangerous condition. It is true that the return air could be tested every few yards or so, thus determining whether the percentage of gas shows an increase, but this method of security entails extreme care and time, which can be avoided by traveling with the intake.

On the other hand, in proceeding with the intake air, in making an inspection of a mine, one is always traveling in fresh air, which a fireboss needs as much as anybody else; and, if there is any standing body of gas, he is going to find it quicker and with more security to himself and to the mine than when proceeding against the air.

The accumulation of gas shown in the sketch submitted is best removed by hanging a brattice in the crosscut beyond and then deflecting the air in the room by slowly closing the door at "*A*," after opening the curtain at the mouth of Room 3, thereby eliminating the possibility of the gas reaching the burning feeder in Room 5. It must not be thought that a small body of gas with a sufficient volume of air will diffuse very rapidly, and that no disastrous consequences will attend its coming in contact with a light on the airway.

Of course, all experienced firebosses should recognize that unusual conditions such as a large standing body of gas has got to be met with unusual remedies. One must not attempt to remove this gas till he is absolutely certain that everything is clear in the airway, that all men are safe and that no lights or possible sources of ignition are on the return.

If one encountered the condition described when making the examination as prescribed by Mr. Bowen, starting at the return end, he would likely think twice before removing the gas, and be certain that nobody or no lights were on the return airway, which he has just traveled and found safe. FIREBOSS.

———, W. Va.

## Promotion of Ambitious Workers

*Letter No. 2*—Referring to the excellent letter of "Fairplay" on this subject, *Coal Age*, Aug. 28, p. 375, allow me to say that it is not always an easy matter to choose, from among a large number of employees, those who are most deserving of promotion and give satisfaction all around when a vacancy is to be filled.

Although a good manager or superintendent will not willingly set aside the just claims of a good worker for recognition when a place is to be filled, he is often compelled to yield to the wishes or demands of a higher officer and advance one less worthly of promotion. Instances of this are frequent and show that the man in charge cannot always be blamed for the favoritism.

However, success in operation depends on the satisfaction of the workers, and to accomplish that every man must be given a square deal. While I believe thoroughly that length of service in the employ of a company is an important factor and should have weight in the selection of a man to fill a higher position, I do not think it should be assumed that one who has been longer on the job is necessarily the more proficient.

Too often we find men holding one position for a number of years, because they are better fitted for that particular work than for anything else. If promoted to a higher and more responsible place they would fail to show the same proficiency. It is here that a good executive shows his ability to discern the kind of work each man is fitted to perform. Promotion based on length of service would establish a routine that would take away the incentive to effort and exertion to qualify for something higher. For that reason, if for no other, men should be selected to fill vacancies in accordance with their fitness for the work, which should be the controlling factor, and not length of service or political or friendly relations and influence.

In Fairplay's letter, mention is made of a man whose ambition had led him to qualify for a higher position and was much disappointed when an outsider was chosen to fill the place, though he himself had worked successfully for the company for 15 years. I cannot feel the same sympathy for this man as expressed by Fairplay, since it would appear, from the fact that the superintendent is said to have remarked that he "did not know the man desired promotion," that the man himself was to blame and not the superintendent.

### THE KEYNOTE IS ACTION

It has always been my plan to get action. My motto is, If you want a thing, go after it, and I believe it is the way every ambitious worker gains success. When a man sits down and waits for promotion to come to him he will almost invariably see it go to someone else. No truly ambitious worker can serve a company successfully for 15 years without his ability and fitness being known and recognized by his superiors.

Some men work with their hands alone, unaided with their brains, and depend on their length of service to win for them the desired promotion. Such cannot hope to be awarded. These are days when men whose knowledge and skill enable them to cope successfully with industrial problems are in constant demand. The man who studies to prepare himself to meet these conditions will not be discouraged by seeing another promoted; but the circumstance will make him more active than ever.

The plan described as adopted a few years ago by a great railroad system, in this country, for the purpose of establishing a more equable basis of promoting and maintaining the loyalty of their employees is an excellent one. If our coal companies would adopt a similar plan the effect would be to increase the efficiency of mining.

Let me ask, here, how many of our mine foremen and firebosses who hold certificates could pass a satisfactory examination given by the general superintendent or manager of their company? If coal companies would hold such examinations yearly many of us would have to study, which would keep all in line with what is most up to date in mining.

A first-class foreman's certificate, I regret to say, is no longer evidence of the holder's knowledge and ability. A certificate obtained a few years ago has lost its meaning when the man has not continued to read and study. Too many are depending on their years of service, rather than on their knowledge of principles of mining. The time is fast coming when the most successful in securing production will be those who study and read to keep themselves abreast of the times, as we need more than practical experience. RICHARD BOWEN.

West Pittston, Penn.

# EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

## Miscellaneous Questions

*(Answered by Request.)*

Ques.—What weight will a double-cylinder engine of the following dimensions lift, allowing one cylinder to overcome friction? The diameter of the cylinder is 10 in., length of stroke, 15 in., steam pressure on piston, 40 lb. per sq.in. The pinion shaft is geared to the drum shaft, the ratio of gearing being 5 : 1, and the diameter of the drum is 5 ft.

*Ans.*—The total steam pressure acting on the piston in one cylinder is $40(0.7854 \times 10^2) = 3141.6$ lb. The length of stroke being 15 in. (1¼ ft.), the turning moment of the total pressure in one cylinder, acting at the center of the pinion shaft, is $3141.6 \times \frac{1}{2}(1\frac{1}{4}) = 1963.5$ lb.-ft. But, since the ratio of gearing is 5 : 1, the turning moment exerted at the center of the drum shaft is $5 \times 1963.5 = 9817.5$ lb.-ft. But the diameter of the winding drum being 5 ft., its radius is 2.5 ft. and the lifting force of the engine exerted at the circumference of the drum is $9817.5 \div 2.5 = 3927$ lb.

*Ques.*—Name and describe briefly the different systems of haulage used in the bituminous mines of Pennsylvania, and state to what conditions each is best adapted.

*Ans.*—In the smaller mines, mule haulage is mostly employed, while some form of mechanical haulage is used in the larger mines. Mechanical haulage includes both rope and motor haulage. There are four types of rope haulage; namely, gravity-plane and engine-plane haulage, tail-rope and endless-rope haulage.

In gravity-plane haulage, a rope that passes over a headsheave at the top of the incline connects the loaded car with the empty, and the descent of the former pulls the latter up the incline. The movement of the cars is regulated by a brake on the headsheave. Sometimes it is necessary to install a "barney," which is a truck having a weight between that of the loaded and empty cars. The descending loaded car pulls the barney to the top of the incline. The ropes are then changed and the descent of the barney pulls up the empty.

In engine-plane haulage, an engine is located either at the head of the incline or at its foot and used to haul the loads up the incline and lower the empties. Where the grade is not too steep the empty cars are permitted to gravitate to the bottom of the plane, their speed being controlled by a brake on the drum. When the engine is located at the foot of the incline, a headsheave is required at the top and the rope passes over the headsheave and reaches back to the bottom. The arrangement then requires twice the length of rope necessary when the engine is at the top of the plane.

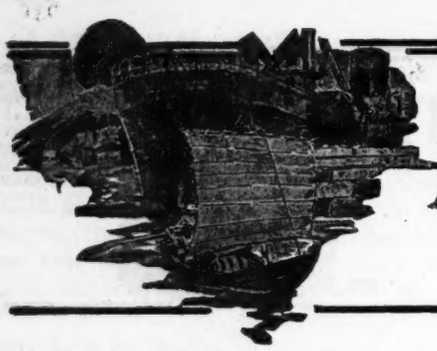
In tail-rope haulage, there are two separate ropes, a main and a tail rope. The main rope reaches from the drum of the haulage engine back to the inby parting where it is attached to the loaded trip standing on the plan an entirely new outfit for next year's installation, parting, ready to be hauled out of the mine. The tail rope reaches from the drum of the engine back to the parting, where it passes over a tails heave and is attached to the rear end of the loaded trip. The tail rope is practically twice the length of the main rope, and unwinds from the drum as the the loaded trip is hauled out of the mine. The tail rope is then attached to the empty trip, which it pulls back into the mine, dragging the main rope behind it.

In endless-rope haulage, there is but one rope, which always moves in the same direction. The rope passes from the tandem winding drums of the engine into the mine to the tail sheave and returns along the haulage road or other passage to the surface, where it is carried over a sheave on a balance truck, which keeps the entire system taut, and returns to the winding drums. In this system two winding drums or sheaves are set tandem to each other, which enables the rope to pass from one drum or sheave to the other and avoids the fleeting or side travel of the rope, by taking only a half-turn over each drum. The loaded cars are attached, at intervals, to the branch of the rope running out of the mine, while the empty cars are attached to the other branch running into the mine.

Motor haulage is performed by either electric or compressed-air mine locomotives. Steam locomotives are not adapted to underground service and are not used to any extent in mines. Electric mine locomotives are operated either on the trolley or the storage-battery system. The use of either of these systems depends largely on conditions in the mine, with respect to gas and the equipment employed for mining the coal.

Mule haulage is adapted to small mines where the main haul does not exceed, say, a half-mile; also to the work of gathering cars in larger mines. Gravity-plane haulage is adapted to conditions where the material mined must be lowered from the face to the gangway, or from the mine entrance to the loading tipple. On the other hand, engine-plane haulage is adapted to conditions where the material must be hauled up an incline or slope. The tail-rope system of haulage is more convenient than endless-rope haulage wherever the roads are crooked and there are sharp turns to be made or considerable grades against the load. On the other hand, endless-rope haulage is adapted to straight roads and where light variable grades balance each other in their effect on the engine.

The use of electric or compressed-air locomotives depends largely on the equipment of the mine and whether or not gas is generated in the workings. Where the mine is electrically equipped and lighted, electricity is generally preferred for haulage; but where compressed-air machines are used for drilling and mining the coal, or where the presence of gas in the mine debars the general installation of electrical machines, the compressed-air system is safer to employ.



# FOREIGN MARKETS AND EXPORT NEWS

EDITED BY ALEX MOSS

## Europe Facing Coal Famine

### Analysis of Situation Shows European Nations Are Using Own Tonnage to Carry High-Priced Cargoes, Leaving to America the Job of Freighting the Less Profitable Coal

With the approach of winter the greatest menace to life in Europe draws on apace. The greatest stress and danger lies in the lack of coal. America has a moundless quantity, but incredible as it may seem America cannot supply the need of Europe. Nor can Great Britain, whose annual production of 287,412,000 tons has shrunk to 214,000,000. Germany's decline is even greater. And while Great Britain's pre-war export of coal ran to 76,689,000 tons, her estimated post-war exports are only 23,000,000 tons or less.

To avert a world shortage America must export upward of 81,000,000 tons. The nation's pre-war export of coal was less than 20,000,000 tons. The excess over pre-war exports which must be supplied by this country, if the world shortage is to be made up, is 62,463,000 tons.

This shortage cannot be met. To make up the deficiency America would have to export within the next few months more than four times as much as it ever exported during an entire year. There is not enough tonnage available. With the trebling food exports even an extra million tons a month would tax shipping beyond its utmost limit. And even that extra million would be of no avail in relieving the distress that threatens Europe.

No phase of world conditions has more closely occupied the United States Shipping Board than this matter of coal for Europe. Keenly alive to it, J. H. Rosseter, Director of the Division of Operations, had H. Y. Saint, head of the Export Coal Department of his division, compile the report which is presented here. It portrays the abnormal demand that is being made upon the United States to take care of Europe from a coal standpoint, shows that the demand that is being made upon the Shipping Board for tonnage to be placed in the coal trade is many times greater than can be supplied, and what is more significant, shows that European nations are doing little or nothing to relieve the situation by using their own tonnage; moreover, that the nations which are doing the least are the ones that are able to do the most.

The outstanding fact, brought out by this analysis, is that European nations are using their own tonnage in trades best suited to their maritime interests and in competition with Shipping Board vessels, leaving the United States to carry the less profitable coal cargoes for the relief of suffering peoples.

"It would seem," said Mr. Saint in the report to his chief, "cognizance must be taken by the Shipping Board of this situation and something should be done to bring European tonnage into this work of distributing coal to European ports.

"The statistics compiled by this department show that Italy is practically the only European government which is extensively using its own vessels in carrying coal from the United States for Italian relief. In the month of July, 20 Italian vessels sailed from American ports with coal. You will notice that Norwegian, British and Greek ships were plying in the Italian trade, which today is considered a profitable one. At the same time the Shipping Board was having demands made upon it to carry coal to Greece, Switzerland and the Scandinavian countries as well as to South America.

"Very heavy demands are being made upon the Shipping Board to carry coal to Denmark. Our tabulation shows that no Danish vessels are carrying coal to Denmark, but a number of Danish ships are carrying coal from American ports to South America, which is a profitable trade when the return cargo situation is taken into account.

"It will be noted that Norwegian and Italian vessels are under charter to carry coal to Gibralter, when the needs in their own countries are great.

"Large demands have been made upon American tonnage to carry coal to the Netherlands, and during July, 17 American vessels sailed from American ports to that country. During the same period only three Dutch ships carried coal to their home ports while two Swedish and one Norwegian ship were in the Dutch coal trade.

"Insistent requests have been made on the Shipping Board to carry coal to Sweden, and as many as 11 steamships have sailed in one month for that country. Yet Swedish steamships in that trade have not exceeded one a month.

"With the increasing demand upon America to supply coal for Europe and to carry it in American bottoms, and with all the demands predicated upon the increasing distress in various European countries, it would seem that immediate steps must be taken to bring about an effort on the part of the various countries to help themselves in this matter of coal distribution.

"In view of the fact that the Shipping Board cannot meet the demands that are being made upon it, in view also of the fact that our vessels are now being used to relieve distress in Europe where the distress is greatest and relief most urgent, it seems imperative that the European nations which are facing a coal famine should do something to relieve the situation by placing some of their own tonnage in the American coal trade, even though that trade is less profitable than the ones on which these vessels have been placed to compete with the new fleet of the U. S. Shipping Board."

From the analysis made by Mr. Saint it appears certain that the people of France, Belgium, Holland, Italy, Denmark, Norway, Sweden, Spain and Switzerland will be among the ones that must suffer most and that the shortage will fall with no less weight upon Germany, Austria-Hungary, including Czecho-Slovakia and Jugo-Slovakia. The total coal requirements of the world next winter have been placed by this authority at 179,511,000 tons, of which 97,723,000 tons can be supplied by countries other than the United States.

This would leave 81,788,000 tons to be furnished by this country. Mr. Saint estimates that there will be furnished 19,325,000 tons, leaving a shortage in the world's coal bin of 62,463,000 tons, a tonnage sufficient to supply the New England States for nearly three years.

Translated into other terms, it would require 1,249,000 cars of fifty tons capacity each to meet the shortage, or 25,000 trains of fifty cars each. Twelve thousand, five hundred vessels of 5000 tons capacity each would be necessary to carry the cargo across the ocean in one trip. More than 60,000 men would have to dig coal at top speed for a year to produce the tonnage.

During the ten-day period from Aug. 29 to Sept. 9 inclusive, the total allocations of vessels to the coal trade numbered thirty-five.

Most of the coal to be carried in these bottoms goes to European destination, with a large portion going to Italy. One coal-laden ship is destined for Buenos Ayres, one to Chile, one to Rio de Janeiro and three are to carry coal to the Pacific Coast for the American Navy.

## Allies Look to United States for Relief in Fuel Shortage

The coal situation in Europe was brought prominently before the public during the month, by a meeting of the Supreme Economic Council in London, at which a warning was given by Mr. Hoover that Europe's coal production was 35 per cent. below normal, and according to the press dispatch, Mr. Hoover stated, "That England's annual coal production has fallen from 292,000,000 tons in 1913 to 183,000,000 tons, and Germany's decline is slightly greater. "Europe," he added, "at the present rate will produce 443,000,000 tons next year, while the amount needed is estimated at 614,369,000 tons." Following this meeting, shipping and fuel representatives of France, Belgium and Italy conferred with Mr. Hoover at Paris on Aug. 4 and decided to urge the Supreme Economic Council to appoint a European coal Commission to coördinate the distribution of European coal, in order to avoid what threatens to be a disaster. Mr. Hoover declined to accept the permanent directorship of the commission, stating that, "He believed the problem to be strictly European, and that the situation cannot be relieved materially by the slight help which the United States can give." It is thought that Mr. Hoover wished to spur the Europeans to put forth their utmost endeavors to meet the dangerous situation.

Without fuel, the railroads cannot transport food and produce; factories are closed both because of inability to get fuel and inability to ship their product. The United States is vitally concerned in helping its principal allies, both from an economic and humanitarian standpoint, and whatever coal can be sent will be of the greatest benefit, and perhaps ward off disastrous conditions. Many persons in the United States, on account of the impending shortage of fuel next winter, feel it is unwise to encourage export business, but winter shortage in the United States usually is very temporary in times of peace, and except from November to February, there is ordinarily no difficulty in supplying home needs. From March to September, the bituminous mines usually work only part time. If during the slackest periods in the Appalachian fields, coal could be loaded for shipment abroad, it would both improve the financial status of these mines and also help in the shortage abroad, which is going to continue for a long time.

The principal causes for this shortage abroad are: (1) Strikes to improve conditions; (2 )individual absenteeism from the mines; (3) shortening the hours of labor; (4) lowered individual effort; (5) shortage of mine supplies on the continent; (6) insufficient railroad trucks and poor train serive on the continent.

The first four of these causes are due to the world-wide labor unrest which affects even the native labor in South Africa, according to a recent address of the retiring president of The South African Institution of Engineers, in which he states that in his group of mines the output per native has fallen 30 per cent since 1914. In Europe, Mr. Rice, chief of the Mining Division of the U. S. Bureau of Mines, observed during his recent visit that there is a very general feeling among the miners that they are not willing to go back to the old order of things in the matter of low salaries, housing and other conditions. This feeling is particularly acute in Great Britain.

In Great Britain, on July 16, 1919, there went into effect the so-called Sankey award, which shortened the hours of labor from 8 to 7, not including the average time of lowering and raising the workmen, but including the time he takes in traveling to and from the working place, the mine owners contending that with the seven-hour workday there was less than six hours effective work performed. While to some extent this might be taken care of in the future,

by increasing the number of employees, there are no unemployed miners at the present time, and moreover the workings, which are laid out for the longwall system, would not provide places at the working faces. This with the other causes has led to a tremendous slump in the production in Great Britain, and it is now a question of how long England will be able to supply its former export trade markets. In 1913, the exports were 77,000,000 tons (2240 lb.) Unless there is serious restriction of home industries and consumption of coal, there will be little or no coal available for export.

In France, the fuel conditions continue serious. There is a loss of 20,000,000 tons output of the mines wrecked by the Germans, which has not been made up by imports from Germany or the Saar fields, where the normal output of 17,000,000 tons per annum has been reduced to about 35 per cent. by reason of lessened efficiency of the miners, claimed in part due to poor feeding.

It was expected that Westphalia, when peace had been made, would at once respond and resume its former large production, but strikes and labor troubles have continued, and there is a most serious shortage of coal so that the remarkable situation is found of coal being imported from the United States to Switzerland and now going up the Rhine on barges through the great Westphalian fields. Sweden, Denmark and The Netherlands continue to receive coal from the United States, though normally all the Baltic ports should be supplied by English coal. France and Italy are also importing from the United States.

Great interest is now being manifested in the export business. The large exporting companies have their own facilities for handling the business, while many of the smaller operators are desirous of getting into this lucrative business; but the greatest difficulty arises first, in getting the allocation of ships, second, in arranging the matter of payment by the foreign consignees, and third, in agreement as to grade and quality of coal.

It would appear that one very important thing must be done—the establishing of standardized methods of taking samples and making analyses. At the present time the U. S. Bureau of Mines is sampling and analyzing American coal purchased by the Swiss and Holland governments. It would seem desirable that similar standardized methods should be followed in shipments to commercial foreign buyers to guarantee the quality of what they recieve, owing to the very great differences in the kinds and quality of coals heretofore used abroad, as compared with those obtainable from this country, and also because of the varying methods of sampling, analyzing and the interpretation of results.

## Prices of Bunker Coal at American and Canadian Ports

Under date of Sept. 27, Willard, Sutherland & Co., of New York, state that the following prices prevail for bunker coal at the American and Canadian ports listed:

AMERICAN PORTS—CURRENT PRICES AS OF SEPTEMBER 27, 1919

| | | | |
|---|---|---|---|
| New York, N. Y. | $6.35 | Pool 9 and 71, f.a.s. ex-lighters. | |
| Philadelphia, Penn. | 6.50 | Pools 9 and 71, trimmed, ex-lighters. | |
| Baltimore, Md. | 6.50 | Pools 9 and 71, trimmed, ex-lighters. | |
| Newport News<br>Sewalls' Point<br>Lamberts point | 6.50 | F.o.b. under chutes at coal piers—trimming extra. | |
| Boston, Mass. | 10.25 | T.i.b. ex-lighters. | |
| Charleston, S. C. | 6.25 | F.o.b. and trimmed, under chutes at coal piers. | |
| Portland, Maine | 11.50 | Trimmed ex-lighters. | |
| Wilmington, Del. | 7.90 | F.o.b. ex-lighters. | |
| Savannah, Ga. | 6.80 | T.i.b. alongside supplier's wharves. | |
| Jacksonville, Fla. | 9.95 | New River-Pocahontas | T.i.b. alongside supplier's wharf. |
| | 8.75 | Stonega | |
| Mobile, Ala. | 7.50 | Sipsey | F.o.b. alongside supplier's wharf. |
| | 6.50 | Pratt run-of-mine | |
| Pensacola, Fla. | 6.26 | Cahaba or Black Creek washed | F.o.b. under chutes at coal piers. |
| | 5.25 | Pratt run-of-mine | |
| | 5.85 | Cahaba or Black Creek R/M | |
| New Orleans, La. | 7.40 | Sipsey | T.i.b. ex-lighters. |
| | 6.50 | Pratt run-of-mine | |
| Galveston, Tex. | 10.50 | Oklahoma steam coal—f.o.b. at supplier's wharf. | |
| Seattle, Wash. | 9.15 | Comox steam coal, f.a.s. ex-lighters. | |
| San Francisco, Calif. | 13.05 | Utah and/or British Columbia, f.o.b. ex-lighters, trimming extra. | |
| San Pedro, Calif. | 8.50 | Utah black | F.o.b. alongside supplier's wharf. |
| | 9.65 | Run-of-mine | |

CANADIAN PORTS

| | | | |
|---|---|---|---|
| Union Bay, Vancouver | 7.65 | Comox steam coal | F.o.b. under chutes at coal piers, trimming extra. |
| St. John, N. B. | 10.50 | T.i.b. ex-lighters. | |
| North Sydney, N. S. | 7.25 | T.i.b. at piers. | |
| Halifax, N. S. | 10.50 | T.i.b. ex-lighters. | |

## Coal Trade of Trieste

Prior to the war the annual importation of coal into Trieste was approximately 103,000 tons, of which about 15,000 tons were from other parts of Austria and about 72,500 tons from England. The annual importation of American coal was only about 3500 tons. The yearly exports of coal from Trieste amounted to some 8800 tons, of which 5600 tons went to Austria and the remainder to Italy, Hungary, Turkey and Greece.

Before the war the total yearly consumption of coal in Trieste and Istria was approximately 400,000 tons. The most important coal consumers of Trieste are the industrial works and the steamship companies. Of the former the principal consumers are the municipal gas works, the electric light and power stations, the Stabilimento Tecnico, and the Alti Forni di Servola. Of the various steamship companies the most important are the Lloyd Triestino (formerly Austrian Lloyd), operating lines to Italy, Dalmatia, the Levant, India and the Far East, and the "Cosulich" Societa Triestina di Navigazione (formerly Austro-Americana), operating lines to North and South America via the Mediterranean ports.

From the outbreak of the European war until November, 1918, the Trieste market was supplied with Austrian coal from the mines of Ostrau in Moravia and Arsa in Istria. In 1917 the Austro-Hungarian Government established in Vienna a Coal Central, which undertook the supplying of coal to all the industrial works, steamship companies and steam and electric railways of the dual monarchy. The Arsa coal mines are located in the southeastern part of Istria. The port of shipment is at the northern end of the Arsa Canal, at the entrance of which the water has a depth of about 75 ft. This entrance is between Punta Ubas and Punta Socciajo near Punta Nera. An Austrian company has been operating these mines, but at present negotiations are under way for the purchase of the shares of that company by Italian capitalists.

The Sebenico coal mines are located in the southern part of Dalmatia, in the district of Knin. The Sebenico coal is a lignite and cannot be used for fuel without the admixture of other coal. Only Arsa and Sebenico coals are at present on the Trieste market, and the local industries use a mixture of one-third Arsa and two-thirds Sebenico. As the coal from these mines is of inferior quality, the uses to which it can be put are limited, and as the supply is inadequate to meet the growing demand, the coal situation in Trieste is critical. On July 1 last the prices of the above-mentioned coal were increased 100 per cent. At present the Arsa coal is quoted at 180 lire (700 crowns) and Sebenico coal at 150 lire (600 crowns) per ton. [At normal exchange the lire is worth 19.3 cents.]

The British coal imported into Trieste for the steamship companies and the local gas and electric works since the signing of the armistice has been under the control of the Commissariato Generale dei Carboni, which has fixed the prices from time to time. It is reported that this Government control of supplies to private firms is about to be discontinued. Local coal dealers say that the recent increase of 6 shilling ($1.46) in the price of British coal will not have much influence on the local market: First, because up to the present time the prices of British coal imported into Trieste have been controlled by the Italian Government, so that such coal has not yet entered into competition; and, second, because the increase makes practically no difference in relation to the high price of coal here to-day. Cardiff coal, which was the industrial coal most used in Trieste before the war, is now quoted at 123 shilling ($29.93) c. i. f. Trieste.

As the result of an investigation just completed by the Trieste consulate, the following suggestions are made to American coal exporters wishing to establish themselves in that region:

1 The steamship companies and local industrial works require lump hard coal. The people are accustomed to use domestic coal, wood and charcoal for heating and cooking, and the available supplies would be sufficient for household purposes if the steamers and industries were supplied from abroad.

2. American exporters should be represented in trade by trustworthy agents interested only in American coal.

3. Through their local agents American exporters must be constantly informed as to market conditions in order to quote competitive prices c. i. f. Trieste.

4 Trial shipments would facilitate the introduction of American coal and get the industrial consumers accustomed to its use.

When local coal consumers are convinced that American coal will be as good as, if not better for their purpose than the coal to which they are accustomed, American exporters can look forward to a permanent market in this territory.

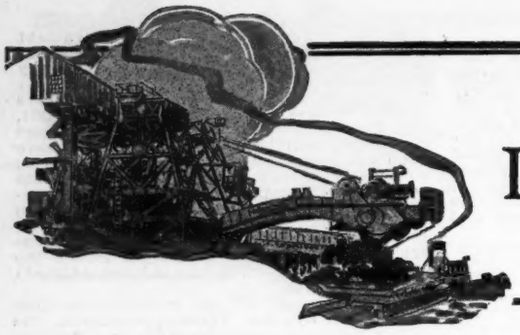
Regarding trade conditions and the prospect of marketing American coal in the countries of the former Austrian Empire, it is believed that the manufacturing industries of German Austria, Jugoslavia, Czechoslovakia and Poland will be in regular operation long before the coal mines in these countries will be able to meet the demand. Mining operations will be hampered by deterioration in machinery and organization, by the necessity of repairing or replacing machinery, and by the lack of skilled miners.

Owing to the enhanced cost of production, due to wage increases, the Austrian companies were obliged to increase the price of coal and coke on Apr. 1, 1919. It appears that the prices then fixed are to continue until Jan. 1, 1920. Thus steam coal cost 200 crowns per ton f. o. b. and coke 340 crowns. Th prices of coal in Upper Silesia have also been increased. Owing to the loss under the peace treaty of Bohemia, Silesia and Moravia, the new state of German Austria will have to import most of the coal required by its industries. In order to facilitate the importation of coal and other commodities from overseas, agreements by the countries concerned will have to be made for the stablishment of special freight rates for the railway carriage from Trieste.

The harbor of Trieste has several breakwaters, so that ships can enter the old Free Port, where the depth is about 60 ft., or at the port of San Andrea, where the depth is about 50 ft. The old Free Port is connected with the Central Railway Station, from which trains leave for Udine, Venice, Fiume and Vienna. The port of San Andrea is connected with the San Andrea Railway Station, from which the trains leave for Northern Austria and Bavaria. Both ports are equipped with modern cranes and elevators for the loading and discharging of vessels. This work is conducted by the Administration of the General Warehouses, which has fixed the charge for loading and unloading coal by cranes at 0.15 lire per ton, and for the use of elevators at:

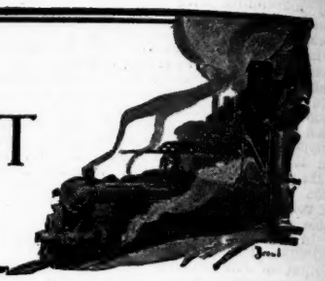
| Using crane of— | Per Day Lire | Per Half Day Lire | Per Hour Lire |
|---|---|---|---|
| 15 tons | 40 | 25 | 8 |
| 30 tons | 50 | 30 | 10 |

draulic power and the 30-ton by electric power. At present the discharge of coal from vessel to wharf or railway car, including stevedore charges, cost about 5.50 lire per ton. In general, the unloading and transportation of coal to the local industries is undertaken by the industries themselves.



# MARKET DEPARTMENT

EDITED BY ALEX MOSS



## *Weekly Review*

### *No Misgivings as to Situation this Winter if Car Supply is Adequate and Labor Stays on the Job.*

Not only is there plenty of soft coal to be had, but increased production due to a better supply of empty cars to the mines precludes any possibility of a coal scarcity this winter if mine workers stay on the job and settle their new wage demands by conciliation and arbitration instead of going on strike Nov. 1, as they now threaten to do.

The past week has disclosed no new developments affecting the market for steam grades of bituminous coal. There is almost no buying interest shown throughout the New England States, a section of the country wherein are located a great number of plants that consume a large tonnage of coal annually. So unsettled is the industrial situation that important consumers are more interested in stopping shipments than in making further purchases.

The iron and steel strike has greatly decreased the demand for coal in the Pittsburgh district. Steel plants would doubtless continue to take coal for stocking purposes if they could, but the strike is of such a nature that coal cannot be unloaded. The entire Mahoning Valley was closed within the first two days of the strike and has remained closed. More than half of the Lake front plants are closed. The Shenango Valley, which was about one-half closed at the beginning of the strike, is now running moderately well. The Monongahela and Allegheny Valleys are running nearly full, as is Pittsburgh proper. On the whole, the coal demand of the steel industry that is supplied by mines in the Pittsburgh district is approximately cut in half.

In the Middle West, there has been a marked improvement in the steam coal market so far as demand is concerned, and prices in practically all of the fields have stiffened. Mines throughout this territory cannot keep up with the demands for domestic fuel, which continue as strong as ever.

There is practically no break in prices, in spite of the many adverse conditions under which the soft coal industry is operating, and in spite of the steel strike. In fact, the efforts of the Railroad Administration to furnish cars to the mines carried the rate of bituminous coal production to a new high record for the year during the week ended Sept. 27, the output for the week totaling 11,667,000 net tons.

The export market continues to show strength. The situation in Italy and in Holland is in many ways acute, and there is every indication that coal exports will continue to show increases from week to week.

Anthracite mine workers have agreed to stand by their war schedule and will not seek to change their wage scales or working hours until Mar. 31, 1920, when the present agreement expires. In the anthracite steam trade there continues to be a large surplus of all sizes. Buckwheat coal is being bought moderately, and there seems to be some increase in the demand from week to week. In the domestic sizes, egg, stove and chestnut continue to be called for. There cannot be said to be a scarcity of hard coal, for though some consumers may not have received all the coal they wanted, practically everybody has some.

If production keeps up to the new high level for the year set during the week ended Sept. 27, no fears need be entertained of a shortage. During that week the hard coal mines produced 1,964,000 net tons, a 6 per cent increase over the previous week's output and 18,000 net tons higher than the output of the last week in August, which up to the present had been the record for the year.

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### WEEKLY COAL PRODUCTION

The efforts of the railroads to increase the supply of cars carried the rate of bituminous coal production to a new high record for the year. The total output for the week ended Sept. 27 (including lignite and coal made into coke) is estimated at 11,667,000 net tons. The railroads provided empties sufficient for the loading of nearly 212,000 cars, an increase of 5.6 per cent. over the preceding week.

The first week of the steel strike has thus not reacted adversely upon the production of coal. The general industrial demand seems to have been active enough to absorb any capacity released by reduction in the customary demand of the steel mills.

Anthracite, like bituminous, set a new high record for the year, during the week ended Sept. 27. Production is estimated at 1,964,000 net tons, 6 per cent higher than that of the preceding week, and 18,000 tons higher than during the last week of August, which up to the present had been the greatest attained this year. The week's output was still materially less than for the corresponding week of 1918, and the total production since the beginning of the coal year is 7,000,000 tons below the extraordinary record of last year.

A general improvement in operating conditions marked the week ended Sept. 20. The mines of the country, as a whole, realized in actual output 71.4 per cent of their full-time capacity. For the preceding week the percentage of operation had been 69.4, and during the week of Labor Day 70.3. The increase was due to a widespread improvement in car supply.

Labor conditions during the week underwent little change. The percentage of losses due to labor in Illinois continued to grow smaller. A slight increase in absenteeism was reported from Somerset, Cumberland, Piedmont, and the West Virginia fields. Losses due to strikes were significant only in the New River and Winding Gulf field, where they reached 8 per cent of capacity. Of the total capacity for the country, only 3.9 per cent was reported by the operators as shut down because of labor.

Mine disability was unusually prevalent in central Illinois, where losses attributed to that factor amounted to one-eighth of the full-time capacity of the district. This raised the per cent lost because of mine disability to the figure of 3.5 for the country as a whole.

The factor of no market continued to grow less important. In the northern and central Appalachian region it has virtually ceased to operate. In the Central, Southern and Southwestern States the market improved. Only in the Rocky Mountain region did the week record a slackening in demand.

Car supply, although remaining the dominant factor limiting production, improved materially. As good or better supply was reported from all districts except Kansas and Missouri, eastern Kentucky, and the southern West Virginia high volatile fields. In the two last mentioned regions the car situation was unsatisfactory.

Losses were attributed by the operators to car shortage as follows:

| | |
|---|---|
| Hazard | 54.2 |
| Northeastern Kentucky | 43.3 |
| Harlan County | 35.5 |
| High volatile of southern West Virginia | 42.4 |

For the country, as a whole, however, losses due to transportation were only 19.8 per cent of capacity, as compared with 22.4 per cent during the preceding week.

The production of beehive coke fell off nearly a third during the first week of the steel strike. For the country, as a whole, the decrease, when compared with the week ended Sept. 20, was 105,080 tons, or 30.6 per cent. Over 100,000 tons of this was in Pennsylvania and Ohio alone. The output of beehive coke in West Virginia and the Southern States has so far been little affected by the steel strike. A slight decrease was reported from the Rocky Mountain region.

In spite of the strike it is to be noted that the demand for beehive coke, as indicated by production, was greater than during any week from mid-April to mid-July of this year.

Increased activity at lower Lake Erie ports marked the week of Sept. 21. The tonnage dumped was 607,896, an increase of 54,517 tons over the preceding week. Total dumpings since the beginning of the year are now two and a half million tons below those of the last season.

### PITTSBURGH AND CHICAGO MARKETS

The iron and steel strike has greatly decreased the demand for coal and the market is now decidedly easy. The steel works would doubtless take coal for stocking purposes if they could, but the strike is of such a nature that coal cannot be unloaded. The entire Mahoning Valley was closed within the first two days of the strike and has remained closed, while more than half of the lake front plants are closed. The Shenango Valley was about one-half closed at the beginning of the strike, but is now running moderately well. The Monongahela and Allegheny Valleys are running nearly full, as is Pittsburgh proper. On the whole, the coal demand of the steel industry that is supplied by the Pittsburgh district is approximately cut in half.

Demand from retail dealers has not opened up to any extent, and with continued summery weather this demand may be postponed. Railroad coal requirements are up to normal. Not much interest is displayed by coal consumers in the wage scale issue of the coal industry.

While the coal market is softer, offerings at lower prices are made by only a few of the operators. Large operators are adhering to former quotations and will curtail production rather than cut. We quote. Slack, $1.80@2; steam mine-run, $2.10@2.40; gas mine-run, $2.20@2.50; prepared gas, $2.60@2.80, per net ton at mine, Pittsburgh district.

High-grade domestic coals from the Illinois and Indiana fields advanced 10c per ton on Oct. 1. For instance, Franklin County lump, furnace, small egg and cook stove are all selling at $3.25 f. o. b. mines. In view of the fact that high-grade Eastern coals are selling at figures far above these, the general opinion is that the Illinois and Indiana operators are perhaps a little too modest. For example, a Chicago wholesaler was able to buy a large tonnage of Pocohontas lump put on the market because of the steel strike. This distributor had no difficulty at all in selling this coal at $5.75 per ton f. o. b. mines. We understand that it was very high-grade coal, being Pocahontas third vein, and was very carefully prepared.